DEC 29 1920
UNIV. OF MICH.

Vol. IX, No. 12 DECEMBER, 1920

JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

CONTENTS

Frontispiece and Sketch—H. H. Rusby, M.D. 1029
Editorial:
The Referendum 1133
Certain Facts about Arsphenamine (Salvarsan) and Neoarsphenamine (Neosalvarsan) 1135
The Year before Us 1138
A General Method for Making Quantitative Microanalyses of Vegetable Drugs and Related Substances—Schneider 1140
The Chemistry of the Heptane Solution—Kremers 1153
Practical Testing of Spirit of Camphor—Lyons 1163
A Criticism of Part II in the U. S. P. IX—Thompson 1168
Ointment of Zinc Oxide—Clark 1171
A Quarter of a Century of Chemical Investigation of a Typically American Genus of Plants—Kremers 1175
Department of Commercial Interests—Fischelis 1177
Laboratory Notes—Ewe 1178
House of Delegates, American Pharmaceutical Association 1186
Proceedings of the Local Branches 1196
Bibliography of Pharmaceutical Research—Arny 1200
Council Business:
Council Letter 7 1205
Editorial Notes 1207
Obituary 1211
Societies and Colleges 1211
The Pharmacist and the Law 1214
Advertising—Cover pages 2, 3 and 4 and pages I-XX.

Published Monthly by the American Pharmaceutical Association: Office of Publication, 211 Church St., Easton, Pa. Editorial Office, 253 Bourse Building, Philadelphia, Pa.
Annual Subscription, $4.00; Single Numbers, 35 Cents.

THE SIXTY-NINTH ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN NEW ORLEANS, LA., SEPTEMBER, 1921

The 1921 meetings of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also be held in New Orleans during Convention Week

Entered as Second-class Matter, January 23, 1917, at the Post Office at Easton, Pa., under the Act of March 3, 1879.
Acceptance for mailing at special rate of postage provided for in Section 1103, Act of of October 3, 1917, authorized July 10, 1918.

PEPSENCIA (Essence of Pepsine, Fairchild) ***has always*** been standardized to an actual digestive activity ***in excess*** of that which should be shown according to the U. S. P. assay of Pepsin by any preparation actually containing 8 grains of pepsin per fluid ounce.

Essence of Pepsine, Fairchild, as sold by us in the original bottle or dispensed therefrom will always be found to have the pepsin strength as above described—the active properties of a U. S. P. content of fully 8 grains of pepsin per fluid ounce.

FAIRCHILD BROS. & FOSTER, **NEW YORK**

MERCK

Genuine ICHTHYOL

is obtainable only under the Merck Seal and Label. ***Bottles and Tubes.***

Write for literature for your Physicians.—MERCK & CO., New York

---

CINCHOPHEN CALCO

TOLYSIN

PROCAINE

ANESTHESIN

ALBUTANNIN

CREOSOTE CARBONATE

Calco

Physicians Recognize the "Calco Diamond" as a guarantee of purity

If your Jobber cannot supply, order direct

Manufactured by

The Calco Chemical Co.

136 Liberty Street, New York City

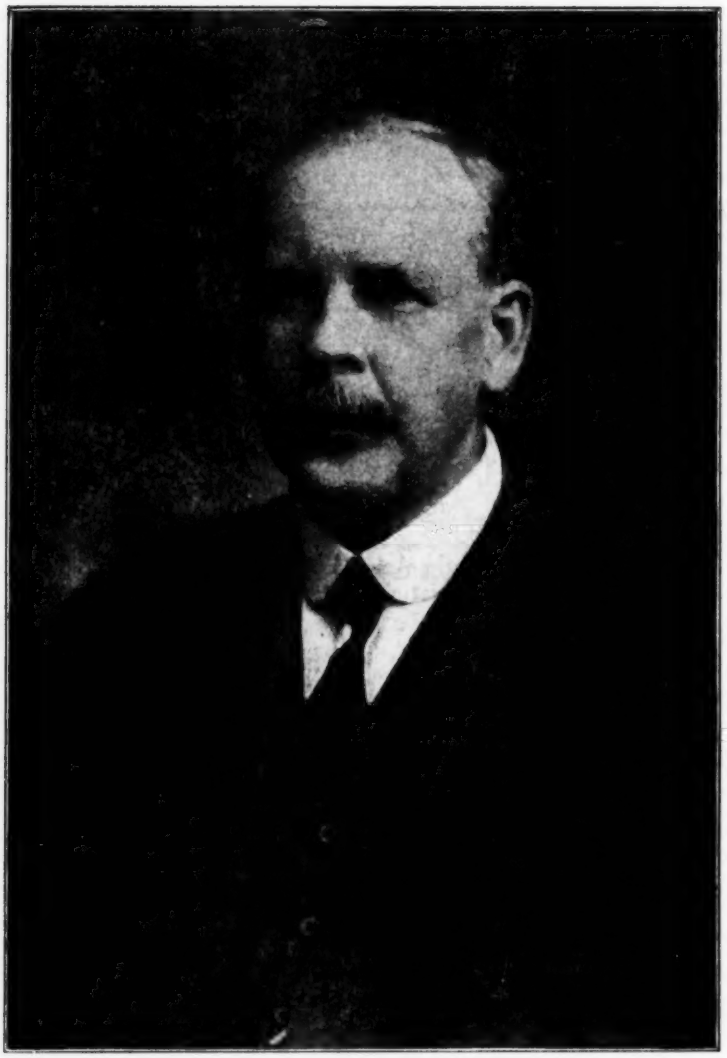
Other "Calco" Products:

BETA-NAPHTHOL, U.S.P.; BENZO-NAPHTHOL, A.M.A.
BETA-NAPHTHYL SALICYLATE, A.M.A.;
BENZALDEHYDE, U.S.P.; CINNAMIC ACID;
METHYLENE BLUE, U.S.P.

H. H. RUSBY, M.D.

NEWARK, N. J.

President of the American Pharmaceutical Association, 1909–1910



H. H. RUSBY

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. IX DECEMBER 1920 NO. 12

HENRY HURD RUSBY.

Reference was made in the November number of the JOURNAL A. PH. A. to the Mulford Biological Exploration of the Amazon Basin of which Dr. H. H. Rusby is the Director. Records of the latter's life and activities may be found in the March issue of the JOURNAL for 1915, p. 331, in "Who's Who in America" for 1910–1911, p. 1655, and in leading pharmaceutical and other scientific publications. From 1883–1886 Dr. Rusby was engaged with Parke, Davis & Co., and during these years did botanical field work in Arizona, and was sent to Bolivia to buy coca leaves. This was the explorer's first trip to South America—he brought back many plants, a large number of which were until then unknown to botanists —the one contemplated will be the fourth; of the others, in that of 1895–1896 he was botanical expert for a colonization company, when about 17,000 specimens of tropical plants were added to his collections; the predominant purpose of the last undertaking was further study of quinine sources in southern Colombia. He has also made two expeditions into Mexico, primarily to discover new sources of rubber.

Preparations have about been completed for the Mulford exploration. The start will be made about May 1, and promises to be the most comprehensive expedition of this kind ever undertaken; elaborate provisions have been made for the searches and investigations contemplated, and also extensive arrangements provided for recording discoveries and sending back material collected for investigation and study by experts. The scope of the expedition has been largely extended beyond the plans first proposed by Dr. Rusby, because of the liberal coöperation of the patrons and the interest of the Government, of universities, other institutions and scientists. The aim of completing a study and collection of South American plants from various viewpoints, of finding new sources of medicinals and economic products, has grown into one of larger proportions and usefulness. While the paramount object is as first contemplated, endemic diseases of the tropics will be studied in their habitat, and the research continued by investigations in the laboratories in anticipation of discovering curative methods. Related consideration will be given to insects as carriers of disease, and thereafter of ways, methods and means of destroying them.

Dr. Rusby will classify and describe the botanical specimens and other experts will make laboratory studies and investigations for standardization and application. Aside from drugs used in medicine, economic products will doubtless be found, and it is reasonable to assume that new sources of supply will be discovered. Photographers are to accompany the exploring party, and thus add to the records of the expedition, which will increase the sum of our knowledge, will certainly add to the powers of direct usefulness of pharmacists, and evidence their direct and indirect services to the world. The perfecting of elaborate arrangements for motion-picture work has required the postponement of the undertaking until spring.

The expedition has much of interest, but will more than likely subject the participants to the severest hardships and dangerous experiences. During six months of the trip the exploring party will be cut off from civilization, in regions where travel is most difficult. This indicates what the undertaking means, and whatever may be said to the credit of those who so generously gave their support, and of those who are exploring for science, for the benefit of mankind, should be in grateful recognition of these services, and also of those who will give their time to the investigation of material found. It is to be hoped that the success of the expedition will exceed expectations, and that all who join will be spared to collaborate in the further studies of their discoveries. The wisdom of the plans is shown in due consideration for scientific initiative and the provisions for coördination and organization in the work. E. G. E.

This building was used by order of General George Washington as a military hospital from December 19, 1777, to August 28, 1778. Herein Dr. William Brown edited the first American Army Pharmacopoeia, 1777–78. See PROCEEDINGS A. Ph. A., 1890, p. 90, and PROCEEDINGS of 1902, p. 114.

EDITORIAL

E. G. EBERLE, Editor 253 Bourse Bldg., PHILADELPHIA

THE REFERENDUM.

As announced on page 1041 of the November issue of the JOURNAL, the referendum vote on the raising of the annual dues of the Association and on the continuance of the Year Book resulted in 655 votes being cast for the proposition of raising the dues to $7.50 per annum with the continuance of the Year Book, while 474 ballots favored a continuance of the present $5.00 dues and a discontinuance of the Year Book.

This victory for the Year Book; this sensible decision that we should recognize the need of increasing our annual dues, when prices of everything had advanced 50 to 100 percent, is on keeping with the traditions of our membership. Moreover, the victory is greater than the figures 655 to 474 indicate. Only 1129 out of our 3,000 members voted and, as it is proper to assume that "silence gives consent," is not the Council justified in believing that out of our total membership of 3,000 only 474 desired the dues to remain at its present figure?

To our friends who prefer the lesser price without the Year Book; to those who have expressed the thought that the Year Book should be sold as a separate proposition, the following facts are submitted:

1. The JOURNAL and the Year Book are the greatest assets of the Association.

2. The Year Book is the continuation of the original Proceedings and the 66 volumes of Proceedings and Year Books constitute a library that literally makes the American Pharmaceutical Association known throughout the world as an exponent of scientific pharmacy.

3. To abolish the Year Book would bring irreparable loss to the scientific prestige of our Association.

4. To talk of continuing the Year Book as an optional sales proposition would eventually mean its abolition, and the possible sequel of the exploitation of a similar work not by the A. Ph. A., but by some private concern, as an advertising proposition.

This type of problem is not limited to our own association. It has confronted the American Chemical Society, which publishes three journals. One is the "popular" magazine, *The Journal of Industrial and Engineering Chemistry*. Then there is that invaluable publication, *Chemical Abstracts*, an essential tool in every first-class chemical laboratory. And lastly there is the highly scientific *Journal of the American Chemical Society*, which records American Research in physical chemistry and non-technical organic chemistry, a publication reflecting the highest type of American chemical thought, although not particularly appealing to the rank and file of the membership of the Society.

The Society realized that its annual dues had to be raised in order to keep a balance in the treasury and it was therefore proposed to increase the annual dues from the present $10.00 to $15.00. Immediately the question was raised: "Why not keep the dues at $10.00 for two journals only and provide $15.00 dues for those desiring all three journals?" The secretary, acting for the Society, answers this query with the following statement:

"A few members do not yet realize why the Society, by an overwhelming vote, confirmed by the unanimous vote of the Council again this year at Chicago, finds it necessary to send all three journals to all of its members. A somewhat larger number of members do not yet understand why it is necessary for each member to pay at least $15.00 per year into the Society's treasury if the Society is to continue its work. As the Secretary has to write many letters on this point, it seemed wise to put the reason again on record.

"The explanation is simple, and to anyone familiar with printing bills it need scarcely be pointed out. It is due to the fact that the chief cost of printing is due to what is known as 'putting on the press,' and that this cost is the same whether one or 17,000 copies are 'struck off.' The cost of administration, editorial office, abstracting, rent, type-setting, etc., is a large part of the cost of each publication. Once in type, the cost of paper, press work, and postage is a fixed figure for each additional copy. Accordingly, if only one volume of each issue is 'struck off,' the whole cost of publication would have to be allotted thereto. If 17,000 copies are issued the cost per volume becomes only a fraction of the cost of a small issue. Accordingly, if a member should drop any one of our journals, the Society would save comparatively little thereby, even taking into consideration the improbable fact that the Society could actually estimate in advance the number to be struck off.

"Some few members, considering their own preference alone, still argue that we should give up one journal, but they forget that to do so would immediately cause a loss of perhaps one-third of our membership who prefer the publication they would themselves discard, and this would immediately increase the average cost of the other two journals. Strange as it may seem, it is easily shown by actual figures that it is cheaper to send all three journals to the whole membership than to send only two to a divided membership."

Certainly this is a fair and frank statement as far as our sister society is concerned and the argument applies with equal force to our own Association and its JOURNAL and Year Book. That all of our members will bow to the will of the majority in this matter of simple justice to the prestige and to the finances of our Association there should be but little uncertainty. That the Association is to be congratulated over the vote favoring the retention of the Year Book there is no doubt whatever. H. V. A.

CERTAIN FACTS ABOUT ARSPHENAMINE (SALVARSAN) AND NEOARSPHENAMINE (NEOSALVARSAN).

DURING the great war, which has fortunately terminated, a Salvarsan famine occurred in the United States. This was due primarily to an embargo placed by Germany on exportation of the drug to this country and later, when this embargo was released, by a prohibition of the transportation of the German product across the seas, on the part of France and England. On representations made by our State Department, this prohibition was later rescinded.

When the supply of Salvarsan became exhausted in the United States, the Dermatological Research Laboratories, an institute organized and conducted for scientific research, succeeded in producing the drug and supplying it during a period of a year or more when the foreign product could not be obtained. The drug was sold to the United States Government at almost a third of the price which the Government had previously paid for the German product.

It does not appear to be sufficiently understood by all physicians and pharmacists that there is an official United States Government designation for Salvarsan and Neosalvarsan. The American terms for these products are Arsphenamine and Neoarsphenamine. The terms Salvarsan, Arsenobenzol, Diarsenol, Arsaminol, Kharsivan, etc., are all trade names and refer to products emanating from the various laboratories. The term "Salvarsan" has become so ingrained in the literature that it is difficult to have it completely superseded by the word "Arsphenamine." It should be remembered, however, that Salvarsan is a proprietary name which is registered and owned by one German laboratory and one laboratory in the United States.

There are now four laboratories in the United States which are producing Arsphenamine and Neoarsphenamine: The Dermatological Research Laboratories of Philadelphia, the H. A. Metz Laboratories of Brooklyn, the Takamine Laboratories of New York, and the Diarsenol Laboratories of Buffalo.

STATUS OF SALVARSAN PATENTS.

Under "The Trading with the Enemy Act" passed during the war, the alien Property Custodian was empowered to seize all enemy-owned property. Acting in conformity with the authority granted under the said act, the Alien Property Custodian seized some four thousand five hundred German chemical patents and sold them *en bloc* to the Chemical Foundation.

The Chemical Foundation is a corporation that was organized for the purpose of encouraging the chemical industries of this country and of stimulating chemical research both for industrial and medical purposes.

The Alien Property Custodian—Mr. Garvan—happens to be the president of this corporation. The corporation is conducted for the public good and not for private gain. After the preferred stock is retired, the proceeds, which are re-

ceived from royalties on Arsphenamine and other medicinals and dyestuffs, etc., will be utilized to subsidize chemical research. Those at the head of the Foundation are philanthropic and public-spirited citizens who are well-known figures in American public life. It is recognized by those in charge of this work that the dye industries and the chemical industries are indissolubly bound up with the production of explosives used in war. It is realized that the United States, in order to be in a position of adequate defence against future aggression by any foreign nation, must have a firmly established chemical industry under loyal American ownership.

LICENSE TO MANUFACTURE ARSPHENAMINE.

During the war, The Federal Trade Commission, a body nominated by the President of the United States to confer licenses upon American citizens to manufacture articles under hitherto German patents, licensed a number of laboratories and citizens to make Arsphenamine and other drugs. The licensees bound themselves to obey the regulations established by the United States Public Health Service Laboratories at Washington. These laboratories, under the able leadership of Dr. George W. McCoy, adopted toxicity standards for Arsphenamine and Neoarsphenamine which are the most rigid of any that exist anywhere in the world. Every lot of Arsphenamine and Neoarsphenamine manufactured in the United States must be submitted to test at the Hygienic Laboratory and receive the approval of the said laboratory before it may be released from the original manufacturing laboratories. This provides a safeguard against the issuance of ampoules which do not come up to the high standard required by the Government experts.

ARSPHENAMINE STANDARDS.

It is required by the Hygienic Laboratory at Washington that Arsphenamine must be administered intravenously to a series of white rats of given weight and be tolerated by 60 percent of the said rats in the dose of 100 milligrams per kilo of bodyweight. This represents a dose, proportionate to bodyweight, about ten times higher than the ordinary dose administered to man. The animals injected must live at least forty-eight hours.

Neoarsphenamine must be tolerated under the same conditions in a dose of 200 milligrams per kilo of bodyweight and the injected animals must live for at least seven days.

It is a remarkable fact that the Salvarsan originally furnished from Germany was tested merely by subcutaneous injections in mice. It is most curious that, despite the highly organized state of science in Germany, a drug which is given intravenously in the human subject should be tested by injection beneath the skin of a mouse instead of being injected into the veins of a lower animal. Various tests that have been made in different laboratories in the United States indicate

that the products which have emanated from Germany have been irregular in their toxicity, some being extremely pure and others being relatively impure. Two out of three preparations of the German product recently examined in the United States Government Laboratories failed to pass the standard toxicity tests required by the Government. There can be no doubt as to the credit which is due to Ehrlich for the masterful work in connection with the production of so remarkable a compound as Arsphenamine. It is to be regretted, however, that greater care was not exercised in testing the toxicity of the drug. It is likewise to be regretted that the drug was marketed at so high a figure as to have made it inaccessible to hundreds of thousands of the sick poor.

Despite the fact that the war brought about great misery and calamity among the various peoples of the world, there has been some slight compensating advantage in the fact that the destruction of the monopoly on Salvarsan has permitted various laboratories throughout the world to manufacture this drug and to furnish it at an infinitely lower figure to hospitals and state boards of health that are now freely employing this drug for the benefit of indigent unfortunates.

TREATY OF PEACE AND THE PATENTS.

The Versailles Treaty of Peace contains a clause which validates the acts of the United States Alien Property Custodian. It therefore confirms the sale, by the said officer, of the German Chemical Patents to the Chemical Foundation. To be sure the Treaty of Peace, as between Germany and the United States, has not yet been signed; it is contended, however, by eminent legal counsel that the sale of the German Chemical Patents to the Chemical Foundation is an accomplished fact and that the corporation in question has full legal title to the patents in question.

Licensees who are producing Arsphenamine and other medicinals, and who are manufacturing dyestuffs formerly under German patent, are obliged to pay to the Federal Trade Commission or to the Chemical Foundation (according to the guarantor of the license in operation) five percent of the gross receipts from the sale of the patented article. Under the Treaty of Peace, German nationals are obliged to look to their own Government for reimbursement, and the German Government is obliged to settle all such claims.

COMPARISON OF AMERICAN AND FOREIGN ARSPHENAMINES.

There has recently been published in the Archives of Dermatology and Syphilology, September 1920, by Dr. George B. Roth, of the Hygienic Laboratory at Washington, an article giving the results of a study of the toxicity of the various American and foreign preparations of Arsphenamine and Neoarsphenamine. It is gratifying to learn from this most carefully carried out investigation that the American products in a general way exhibited a lower toxicity than the foreign

products and this is particularly true with regard to certain preparations of neoarsphenamine made in this country. It is evident, therefore, that not only have the American laboratories produced organic arsenicals equal in quality to those made in the original laboratories abroad but they have actually produced products of lower toxicity and, therefore, of greater safety. J. F. S.

THE YEAR BEFORE US.

IN one of his "Two Minutes of Optimism" Herman J. Stich says: "If we are ever to get on our feet and enjoy something like normal times, we ought to cut out ten-tenths of the talk and rise to the business of working, and working our hardest to earn and deserve our present keep and future comfort. Team work, loyalty, coöperation—these are the words that were potent in war and are more than ever powerful in peace. They are the driving wheels of commerce and happiness, and they must be the motive power of every worth-while worker."

It has been said that the dissemination of propaganda by the Russian Reds turned many of the followers of Baron Wrangel against him and accomplished his rout. The value of propaganda was revealed in the great war, and that the influences may be for good or evil. It is contended that a panic would have resulted in 1907 from the then depressed conditions, but the newspapers refused to lend themselves to bringing it about; their attitude turned the minds of the people from gloom to light, and confidence was gradually restored. As the *New York Commercial* said in a recent editorial: "We can make no mistake if we dwell with the utmost confidence upon the greatness and richness of our country's resources. They are illimitable. We have fed the world. We have clothed the world. We have given the world the machinery which enabled it to help itself, and yet we have been able to supply our own wants and have vast surplusses in store. Our ability to produce is greater than it ever was. Our financial power is unimpaired. Some things are out of joint, but only out of joint."

This is a readjustment period, in which there are always attendant inequalities and uncertainties, differing in various sections of the country. While some may have contended otherwise, quite as many suffered because of inflation of prices as from present deflation. The rational point of view is to build up on the established foundations; the conditions of recent years could not be permanent without more difficult adjustment than the present. This country will go forward; deflation of prices has its pains and sorrows; there is need for more coöperation, less selfishness; more thought for the welfare of the nation, less doubt of the ultimate outcome.

The Association has had a steady growth throughout the year; with over three hundred names already added to the list of membership, it is reasonable to expect a larger number of additions than in any previous Association year; it

must, however, not be overlooked that the time elapsing between the Washington and the New Orleans meetings will be nearly four months longer than usual and, hence, there should be many more accessions.

The higher price of paper added to the costs of the Association's publications; we profited by a contract which terminates with this issue; we will have to pay considerably more for paper than ever before, but no one doubts the reasonableness of the assertion that there will be a material reduction in paper prices before the end of 1921. The increased income of the JOURNAL has largely offset the higher costs of the year, but the coöperation of the members will be required in order to do so next year. An official organ is subject to many limitations from which other publications are exempt; there should, however, be opportunities for the members to lend a helping hand by encouraging advertising patrons; for such aid and all other coöperation the Publication Committee is grateful. Lend a hand!

Viewed from the point of averages the past Association year has been satisfactory; the revisions of the United States Pharmacopoeia and National Formulary are going forward and, we are advised, greater progress has been made than during former like periods. Possibly the most distressing things pharmacists have to contend with are the uncertainties and rulings of the prohibition law; there should be some way to stop illegitimate sales of alcoholic beverages without disturbing the legitimate sales of medicine.

It is probable that Christmas will have passed before this issue of the JOURNAL reaches the members, due to additional work of preparing the index, etc., for the December number; may the Christmas have been a joyous one and free from sadness. A New Year will soon be entered on the records of time, and in bespeaking for all the members a reasonable share of happiness and prosperity the hope is expressed, which in our opinion is well founded, that the Association will go forward in its good work, confident that a broad survey of antecedents and concomitants will reveal that Pharmacy and the Association have progressively developed in the past and will so continue, with a realization by pharmacists of their important mission.

E. G. E.

MORALITY IN BUSINESS.

Governor Coolidge in an address in New York on December 4 dwelt with especial emphasis upon one phase of the business life of today that is receiving the serious attention of sober-minded folk who are old-fashioned enough to cherish the belief that morality is still the basis of permanent success. That phase has to do with the gradual weakening of public faith in what is known as the "sanctity of contracts," a term that is quite as often abused as it is used in its proper meaning. When business men imagine that they can with impunity break a contract or agreement whenever they find it to their interest to do so, they strike at the very root of all commercial intercourse and destroy that basis of confidence and mutual respect without which the whole commercial and economic structure would speedily fall to pieces.—From an Editorial, *Philadelphia Public Ledger*, December 6.

A GENERAL METHOD FOR MAKING QUANTITATIVE MICROANALYSES OF VEGETABLE DRUGS AND RELATED SUBSTANCES.*

BY ALBERT SCHNEIDER.

Several special microanalytical methods (qualitative as well as quantitative) have already been given. Attempts have been made from time to time to develop quantitative microanalytical methods which might be generally applicable, notably by Chamot, Meyer, Hanausek, Weinzierl, König, Vogel and others. These quantitative methods are largely based upon the fact that certain tissues and tissue elements are quantitatively fairly constant in plant organs and plant parts and in the various manufactured plant products found upon the market. For example, mature ginger contains a fairly definite percentage of starch. Green apples contain considerable starch, whereas ripe apples contain only a trace of starch. Belladonna roots gathered too early in the season are deficient in starch. Old thick cinnamon bark is deficient in bast. Cloves contain no sclerenchyma cells, whereas clove stems are rich in this tissue. The chief difficulty in the way of formulating definite working methods, is the lack of available data upon which to base such methods. For example, if we had a record of the starch content of ginger, of the apple, of belladonna root, of aconite root, of colchicum corm, etc., for each month of the growing season, then we could readily use the starch factor in determining the percentage of the articles gathered green or too early in the season. If we had a complete morphologically descriptive record of the development of the pollen grains in the insect flowers, we would then be in a position to determine quantitatively the amount of overripe flowers used in a given insect powder. In other instances it is possible to work out on the spot the necessary data for each quantitative analysis; as, for example, in the estimation of the percentage of stems in cloves, the percentage of black pepper refuse in black pepper, the percentage of stems in senna leaves, etc. Patience and a willingness to work are the essentials to success in the working out of such methods. As the details for the quantitative microanalysis of any one vegetable substance are fully and accurately worked out, the figures obtained should be carefully and permanently recorded for the benefit of those who follow after.

The chief source of error in making quantitative microanalytical determinations, of the kind here described, is the fact that while the different tissue elements and cell contents are fairly constant in tissues of the same kind (in the same relative position and of the same age and seasonal growth), we have no usable records of the quantitative tissue variations in plants, more especially in the perennials. For example, how does the bast, sclerenchyma and bark parenchyma in the bark of the white oak vary from year to year, not only in the trunk of the tree but also in the branches? Such a study would be of great value in the practical application of the method in the examination of cinnamon barks, sassafras bark, wild cherry bark, cascara bark and barks in general. What is the annual increase in fibrous tissue in belladonna roots? What is the relative amount of fibrous tissues in the wild growing and in the cultivated chicory? What is the relative amount of fibrous tissues in trimmed licorice roots and in the licorice trimmings? What

* Read before Scientific Section, A. Ph. A., City of Washington meeting, 1920.

is the exact quantitative relationship of like tissues in the inner and outer barks of the same species of tree? Since such data are not available, they must be carefully ascertained for each individual case or problem and the figures obtained carefully recorded.

At best any quantitative microanalytical methods which may be worked out, will give approximate results only; however, these approximate results are sufficiently accurate for all practical purposes. The chief factors in the variation of results are dependent upon the fact that the tissue elements and cell constituents vary (in different vegetable substances of the same kind gathered at the same time) in proportion to the size of the plant part or plant organ. This difference amounts to but very little in average commercial articles of the same kind and may in fact be wholly ignored. The chief reason why the microanalytical methods should be developed is because they are frequently the only means by which we may get the information desired, the chemical methods being wholly inapplicable.

The following general method is given with the hope that it will serve as a basis for a further development of this most important addition to the analytical methods employed in food and drug laboratories.

1. *Selecting the Sample.*—Secure an average commercial sample of the crude drug or spice, free from impurities. Great care must be observed in selecting and preparing an average sample. It should be a true average sample of the commercial article of recognized standard quality or grade as defined by the Department of Agriculture, Bureau of Chemistry, or in case the article is not defined or described by the Bureau of Chemistry, it must be of the quality and grade generally recognized in commerce, or as described or defined in recognizedly authoritative works of reference. Foreign inclusions, as vegetable tissues, dirt, clay, sand, pebbles, etc., must be removed by any suitable method, provided that none of the substance of the article itself is thereby removed or destroyed or rendered unrecognizable. Enough of the material must be taken to assure an average sample for analytical purposes.

In order to be able to select an average or representative sample of the commercial article, considerable experience is necessary. Spice dealers are, as a rule, excellent judges of the quality of the products to which they have given years of close observation. The wholesale drug dealers are thoroughly familiar with the appearance of the crude drugs as they are offered on the market. Grain merchants can, at a glance, determine the grades of the various cereals. Tea experts will recognize aromas and flavors entirely lost to the inexperienced observer. Fortunately, it is not expert ability which is required to select a representative sample, but rather a familiarity with a fair quality or grade of the articles to be examined. If, for example, it is desired to examine ground black pepper as to the approximate percentage of pepper hulls present, the comparison is to be made with a fair quality of whole black pepper, not with so-called "grinding peppers," or peppers otherwise defective, or with some special commercial variety or blend of black pepper. Before grinding, all sand, dirt, pepper stems, and markedly defective fruits must be removed. Considerable care must be observed in selecting an average sample of a root drug or of a drug composed of roots and rhizomes, or of leaves and stems. It is necessary to have on hand carefully selected average samples of drugs, spices, cereals, coffees, teas, cocoas, etc., inclusive of the various refuse tissues and the various milling by-products, as well as articles commonly employed as adulterants, such as nut shells, olive pits, tea dust, cocoanut shells, screenings and tailings, refuse and trimmings, colocynth seeds and rind, corn cobs, corn silk, bran and middlings, cereal chaff, wild mace, wild nutmeg, chicory, male fern chaff, tobacco stems, senna stems, senna siftings, roots of *Ruellia ciliosa*, false senega, pokeroot, etc., etc.

2. *Grinding or Powdering the Sample.*—After the average sample has been garbled, cleaned and thoroughly dried, it is reduced to a No. 80 powder, inclusive of all tissues which may be present.

In some instances it will be found necessary to reduce the material to be examined and compared, to a much greater fineness, in a special mill or a mortar. In order to make accurate starch counting possible the starch-bearing tissue must be made sufficiently fine to pass through a 200-mesh sieve or through bolting cloth. In other instances certain tissues may be separated and removed in comparative purity by means of very coarse mesh sieves (Nos. 8, 20, 40). In this manner such substances as bran, crude fiber, coarser meals, shells, etc., may be separated from the finer elements and their percentage values determined separately, as will be explained.

3. *Mixing the Powdered Sample.*—After the grinding, the entire amount must be thoroughly mixed by means of a spatula. Shaking in a container is not satisfactory. If the amount of the material is considerable (20 grammes and more), divide the thoroughly mixed material (spread out in a circular layer) into quadrants, remove one quadrant and again mix this thoroughly by means of a suitable spatula. A second division may be made if necessary. The final sample should be not less than five grammes.

4. *Making the Diluted Suspension.*—Dry the thoroughly mixed sample for one hour at a temperature of 80° C.[1] Weigh out one gramme of the sample and place it in a 25 Cc. graduated cylinder, add 5 to 10 Cc. of distilled water (or 5 to 10 Cc. of a mixture of equal parts of distilled water and glycerin) and mix thoroughly by means of a glass rod. Fill up to the 25 Cc. mark with a five percent gum acacia solution and again thoroughly mix. The gum solution will hold the tissues in suspension until the microscopic examination is made. The above makes a dilution of 1–25, which will be found satisfactory in most cases. Higher dilutions, as 1–50, 1–100, 1–250, may be used if desired, or if necessary for accurate results, as in starch counting.

Other suspending media may be used, as glycerin, oils, a thin syrup, solution of cherry gum, solution of gum mastic, gelatin solution, India gum solution, plain vaseline, etc. It is advised to stir the material in a little water first, as stated above, for if the gum solution should be added at once, considerable difficulty may be encountered in getting minute particles, starch granules in particular, evenly distributed. It is of course necessary to stir and mix the suspension thoroughly each time a new mount is to be made.

5. *Making the Counts.*—The mounts must be made without a time lapse in the entire procedure. Immediately after the thorough mixing, take up from 0.5 Cc. to 1.00 Cc. of the material by means of a graduated straight cylinder pipette, having a free outflow (1 Cc. or 2 Cc. pipettes graduated into tenths), reject 0.1 to 0.2 Cc. and then deliver just 0.2 Cc.[2] upon the counting chamber or counting slide and at once mix and spread this out between the two slips on the slide (use a platinum loop or needle, or any blunt needle, or a very thin glass rod), and cover with the special rectangular cover glass, by placing the proximal end of the cover at the distal ends of the two slips, pushing it forward upon the two slips, lying flat upon them, or lay it in place sidewise. If the exact amount indicated (namely, 0.2 Cc.) has been properly spread and the cover glass carefully placed, the entire space between the two slips and the cover glass will be occupied by the material without any excess or overflow. The mount should be set aside on a leveling table for a few minutes, otherwise starch granules may become unevenly deposited by the force of gravity.

---

[1] This is not essential for practical purposes.

[2] Since the counting chambers have a uniform capacity, namely, 0.20 Cc., it is not necessary to use a pipette, simply use enough material to fill the cell.

If the powders to be examined are very fine, as starches and some meals, face powders, dusting powders, etc., the counts may be made by means of the hemacytometer, instead of the above special counting chamber. A number 80 powder does not permit the use of the hemacytometer for counting. It is perhaps self-evident that actual numerical determinations per Cc. or per gramme may be made by means of the method just outlined, since definite quantities and definite counting areas are used.

If it is desired to make careful starch counts of drugs and spices, it is necessary to use a higher degree of fineness. The particles must be small enough to pass through a 200-mesh sieve or through bolting cloth. In the case of a vegetable substance having starch aggregates, it is advised to count the aggregates as one, rather than to attempt to give the number of individual granules in each aggregate, as for example in making starch counts of oat, rice, aconite and buckwheat, but care must be observed not to omit to state this in the recorded results.

In the above method it is not necessary to give any attention to differences in specific gravity of the different tissue elements and cell contents. Should it be desired to give the percentage of sand present (by weight) in a given vegetable powder, it would be necessary to ascertain by the trial method that mixture of the substance and sand which would give the same counts as the article under examination. Let us assume that by the trial method we found that the addition of 5 grammes of sand to 5 grammes of the powder we obtained the same sand count as in the substance under examination, then we would know that the sand adulteration amounted to 50 percent. However, in the case of sand adulteration, the simpler and almost equally accurate beaker or test-tube sand test will be employed, rather than the microscope.

The depth of the mount, namely 0.2 mm., requires good working distance of the compound microscope in order that the entire depth may be brought into view. The cover glass used must be thin, not to exceed the thickness of the ordinary No. 2 covers. The usual lense combination (ocular and objective) giving a magnification of about 450 to 500 diameters may be used. A good observer who is entirely familiar with tissues and tissue elements could use a lower magnification with better effect, such as a well-corrected combination giving a magnification of about 180 diameters.

The procedure is as follows: Carefully examine each and every separate and distinct field, counting all of the characteristic tissue elements and record the findings numerically. The mechanical stage will be of advantage in shifting the counting chamber. It will be found that from thirty to fifty distinct fields can be counted in one mount. The averages of not less than fifty counts should be taken upon which to base the percentage estimates of quality or adulteration.

Before beginning the counts, it is advisable to look the mount over under the low power (about 90 diameters) for the purpose of ascertaining whether or not the material is uniformly distributed. If it is unevenly spread, a new mount should be made. In fact, the low power alone is used in examining some substances, as, for example, Cinchona bark, the identity and purity determinations of which are based upon the counting of the characteristic large bast elements. Difficulty may be encountered in getting the total counts of aggregates of cells, as bast and sclerenchyma. As a rule, however, in a number 80 powder, aggregates which are so large as to make counting difficult, are rare. Some investigators have suggested that the quantitative estimates should be based upon the actual measurements of cells and cell contents. This is not necessary, as the average of the numerical count is fully as accurate as the average based upon measurement. However, as already indicated, where identity depends upon differences in size, then measurements (linear) must be made.

The individual field counts are to be made in the following manner: In the case of rather coarse particles, as the larger bast cells, groups of sclerenchymatous tissue cells, fragments of fibrous tissue, fragments of vascular tissue, etc.,

for which the low power is usually employed, count all of the recognizable structures which lie within the circular area of the field of view, including all of the counting groups lying across the margin of the field, provided the groups or the cells extend far enough into the field of view to be distinctly recognizable. Next, shift the mount so that the new field does not reveal any of the elements of the preceding field. Unless this rule is closely observed there is likelihood of counting one cell group twice. This must be avoided. On the other hand, it is advised not to shift the mount more than is necessary to obtain an entirely new field, as above explained.. The counts should be made in groups of ten, selected from five nearly equidistant areas of the mount, avoiding the extreme margins of the area of the mount, and the average of the fifty counts is taken. If the different group counts (of ten each) show wide numerical variation, it indicates that the material was not uniformly distributed on the counting chamber. The dilutions from which the counts are to be made should be such that not more than five to ten counting elements will appear in one field of view.

In making numerical counts of minute particles, such as starch granules, trichomes, epidermal cells, sparingly present and comparatively small bast and sclerenchyma cells, for which purpose the high power is usually employed, it is advisable to make the dilutions such that not more than from ten to twenty-five of the counting particles will appear in one field of view. In such cases it is the rule to count one-half of the particles which lie across the margin of the field. If the tissue elements upon which the percentage counts are to be based, are very sparingly present, from one to two or even less than one per field of view, it is necessary to take the average of many counts, 100 fields and more, in order that the average obtained may give fairly accurate percentages.

In some instances coloring agents such as phloroglucin and hydrochloric acid (lignin test), iodine test solution (for starch), and chlor-iodide of zinc, etc., will prove useful.

It is necessary that the same microscope and the same objectives and ocular be used at all times, in order that the results may be relatively uniform. For instance, should a partial count be made with one instrument, and completed with another instrument, even if approximately of the magnifying power, the results would be inaccurate. In order that the work of different analysts may be unified, it is necessary to adopt standard methods. The surface area of the field of view of each microscope used must be accurately determined by means of the stage micrometer. The Bureau of Chemistry method for the examination of tomato products directs that the field of view be unified by means of the draw tube, so that each field shall equal 1.50 sq. mm. (diameter of field of view equals 1.382 mm., therefore, area of field equals 1.50 sq. mm.). This method is faulty because no allowance is made for the differences in magnification of the microscopes used. Proper adjustment of this kind should be made by means of the ocular diaphragm, after having reduced the microscopes to the same magnification by means of the draw tube. Accurate comparative results may be obtained by any number of analysts provided a counting chamber of definite area be used. The special counting chamber recommended has a depth of 0.2 mm., the total contents of the entire area being 0.2 Cc.

6. *Making the Comparisons.*—In the identical manner as above set forth (1 to 5, inclusive), prepare and examine the article to be compared and of which the quality or purity is to be determined. From a comparison of the two averages of counts thus obtained, it is possible to determine the approximate percentage of admixture and adulteration. Let us suppose that the article in question was Cassia cinnamon and the average counts were as follows:

	The standard cinnamon.	The compared cinnamon.
Bast cells	2.5	0.8
Sclerenchyma cells	12.1	14.0
Starch granules	50.0	13.0

The most diagnostic tissue of cinnamon is the bast and if we use this count alone (2.5 : 0.8 : : 100 percent : x percent) the conclusion would be drawn that the article in question was 32 percent adulterated or 32 percent below a good or standard quality of cassia cinnamon. The other counts (sclerenchyma and starch) are corroborative. The bark parenchyma count is not given because the microscopic appearance of this tissue is non-characteristic, the cells being much broken up making counting difficult, if not impossible. The odor of the compared article was musty and the taste quite feeble. The conclusion based upon the organoleptic tests alone is that the article in question is of very inferior quality, made from old bark, and that adulteration amounts to over 30 percent.

	Standard insect powder.	Compared insect powder.
Pollen grains	5.4	0.2
T-shaped or spindling hairs	2.0	2.1
Sclerenchyma cells	10.0	0.6
Fibrous tissue	8.0	60.0

The findings would indicate that the article in question was 100 percent adulterated and that the adulterant was Pyrethrum stems. The small amount of pollen found in the compared article may be wholly ignored, as that amount of pollen is normally present in and upon leaf and stem tissue, even though no flowers are present. A so-called insect powder may show abundant pollen grains and yet be 100 percent adulterated, as when foreign flowers are used, hence the analyst must be able to recognize different pollens.

	Sample powdered cloves.	Clove stems.
Bast cells of clove stems	6.0	10.0
Sclerenchyma cells	12.0	21.0

In the above example the comparison is made with pure clove stems, which article is the most common adulterant of powdered cloves and in this case the two tissues, namely, bast and sclerenchyma, are present in fairly constant ratio, hence both counts may be used and should check each other, if carefully made. The double proportion would be 10 : 6 : : 21 : 12 : : 100 percent : x percent. $10x = 600 = 60$ percent; $21x = 1200 = 58$ percent. Under the law (federal pure food and drugs act) 5 percent of stems are allowed. 60 percent less 5 percent leaves 55 percent unlawful adulteration in this case. In this case the average of 60 per cent and of 58 percent, namely, 59 percent, should be taken.

	Sample cocoa.	Cocoa stems.
Fragments of spiral ducts	3.8	13.9
Sclerenchyma cells	2.6	10.0

The spiral ducts are most readily recognized and are fully as diagnostic as are the sclerenchyma cells. Both tissue elements should be included in the count and the average of the two percentages obtained should be used. Thus, 13.9 : 3.8 : : 10.0 : 2.6 : : 100 percent : x percent. $13.9x = 380 = 20.1$ percent and $10x = 260 = 26$ percent. $20.1 + 26 \div 2 = 23.05$ percent of shells in the cocoa under examination. Under the law 3.50 percent of shells (called "crude fiber") is allowed, hence in the above case we have $23.05 - 3.50 = 19.55$ percent of excess of shells or crude fiber. The starch count is of little value because this substance is present in small amounts and is furthermore quite variable in amount in the different varieties of cocoa. The endosperm cell count is impracticable because the cells are very much broken up. The amount of vascular elements (represented by spiral ducts) and of sclerenchyma cells is negligible in absolutely pure (wholly freed from shells by hand) cocoa and chocolate.

In the case of aconite root, belladonna root, colchicum corm, ginger, and other plant structures rich in starch, a careful starch count would indicate whether or not the article was gathered out of season or before maturity. In the case of leaves and herbs which contain distinctive trichomes, as senna, digitalis, artemisia,

etc., these structures would serve as the basis for percentage determinations. In other cases measurements (relative size of starches in Rio and Carthagena ipecacs, relative lenghts of trichomes in India and African senna) must be resorted to in order to determine percentage admixtures.

In many instances it may not be necessary or even desirable to reduce the substance to uniform fineness. In a compound, as cattle, chicken or condition powder, one or more of the components (as bran, crude fiber, sulphur, charcoal, meals) may be separated in comparative purity by means of the nest of sieves; the several coarse and comparatively pure components are weighed and their percentage values finally computed. The finer components are mixed and reduced to the desired fineness for making the microscopic counts as already explained, and the results added to those obtained by the sifting process. The following will serve as an illustration of the method of procedure:

A condition powder, using ten grammes of a well mixed sample:

Total weight of sample	10 grammes
Bran, on coarse mesh	2.3 grammes
Corn meal, on next finer mesh	3.6 grammes
Finer remainder, on No. 60 mesh	4.1 grammes

The finer remainder reduced to a No. 200 mesh powder and examined microscopically gave the following counts (one gramme of the powder suspended in 99 Cc. of the gum solution):

Corn starch	51,000,000 per gramme
Wheat starch	8,000,000 per gramme
Sulphur particles	13,000,000 per gramme
Charcoal particles	32,000,000 per gramme
Wheat tissue elements	800,000 per gramme

In the above counts the corn starch count is to be interpreted in terms of corn meal, as no corn starch was added as such. The wheat starch count and crude fiber of wheat is to be interpreted as wheat middlings. The percentages of sulphur and of charcoal are determined by the actual trial method. The following is the reconstructed formula of the condition powder, based upon the above data.

Condition powder.

Wheat bran	25 percent
Wheat middlings	15 percent
Corn meal	40 percent
Sulphur	10 percent
Charcoal	10 percent
Total	100 percent

Corn meal reduced to a fineness so as to make a count of the total starch granules possible, gives 1,305,000,000 granules per gramme. The starch content of wheat middlings varies considerably, but an average article will give a starch count of 200,000,000 granules per gramme. One gramme of sulphur will show about 140,000,000 particles per gramme. The number of charcoal particles per gramme will depend upon the degree of fineness, in the above about 350,000,000 per gramme. From these figures it is simple to deduce the formula given.

The experienced microanalyst can estimate percentages with some degree of accuracy by optical judgment, but such estimates will not be acceptable in court proceedings. Thus, based upon the inspection of an ordinary slide mount, certain face powders are declared to contain about three percent of rice starch or corn starch, so-called arrowroot biscuits show about 2 to $2^1/_2$ percent of arrowroot starch, a pancake flour is estimated to contain 25 percent buckwheat and 75 percent wheat flour; a baking powder is estimated to contain 25 percent corn starch; etc. This is the only method possible in cases where the amount of the material is too small to permit the use of definitely weighed amounts or definite volumes.

This is clearly illustrated in the following rather extreme and highly complex example. A bit of vomit smear on a small piece of newspaper was submitted by a physician with the explanation that it represented a medicinal substance of which he desired to know the composition. A careful microscopical examination of the smear revealed the following ingredients:

1. Starch granules and the bast cells derived from the peeled roots of *Althaea officinalis*.
2. Papillose epidermal cells with red coloring matter of the petals of the red rose.
3. Abundant globules of metallic mercury.
4. Numerous chalk particles.
5. A few pollen grains.
6. Crystals of calomel.
7. Abundant crystals of basic mercuric sulphate (turpeth mineral).
8. The starch granules, yellow lignified fibers and the crystal bearing fibers of *Glycyrrhiza glabra*.

As stated in the introduction, one of the most important requirements or qualifications on the part of the microanalyst, is the ability to interpret the finding intelligently and correctly. The above findings are not numerous nor were they difficult to recognize. The interpretation proved very interesting, as follows:

(*a*) Confection of Rose, U. S. P. indicated by (2) and (5). Turning to the Pharmacopoeia, the formula for confection of rose was copied.

Red rose petals (No. 60 powder)	80 grammes
Sugar	640 grammes
Clarified honey	120 grammes
Stronger rose water	160 Cc.

(*b*) Blue Mass, U. S. P., indicated by (1), (3) and (8).

Mercury	35 grammes
Licorice powder	5 grammes
Althaea powder	25 grammes
Glycerin	33 Cc.
Honey of rose	34 Cc.

(*c*) Gray Powder, U. S. P., indicated by (3), (4) and (5).

Mercury	38 grammes
Clarified honey	10 grammes
Prepared chalk	57 grammes
Water, ad	100 grammes

(*d*) Calomel.

(*e*) Turpeth mineral.

Based upon the optical appearance of the several ingredients of the smear as seen under the microscope, assisted by a number of trial combinations which were compared with the smear (microscopically), the following was given as the formula of the medicinal substance represented by the material upon the bit of newspaper:

Reconstructed formula based upon the above.

Confection of rose, U. S. P.	8 parts
Blue mass, U. S. P.	12 parts
Gray powder, U. S. P.	35 parts
Calomel	15 parts
Turpeth mineral	30 parts

Naturally, problems of the kind just illustrated require much time and careful study, and as already indicated, much experience in the practical use of the compound microscope.

The following quantitative microanalytical determinations should be made by the student under the direction and guidance of the instructor. Each problem

will require at least one full laboratory period. The exercises are graded, beginning with a few simple percentage determinations of simple powders, the microscopical characteristics of which are easily recognized, and ending with the percentage determination of a compound powder. By the time the student has worked out the ten problems very carefully, he will be in a position to solve any ordinary problem in vegetable drug adulteration.

The work done by the members of the class should be compared and discussed and the differences in results should be accounted for by the instructor in charge. If the work of the students has been carefully done the percentage differences based upon the counting methods should not exceed 5. If the percentage differences exceed 5 the exercise should be repeated. The personal factor must be carefully considered. The instructor in charge must explain each problem very carefully and in great detail and no student should be allowed to begin upon the counts until it is ascertained for a certainty that he understands fully what the problem is and what the count, which he is about to make, represents. He must know why it is that only one or two tissues of each drug are selected for the purpose of making the percentage counts. The various quantitative microanalytical methods which have been proposed should be explained and discussed and the advantages and disadvantages of the several methods explained. The results of the microanalytical method herein recommended should be compared with the results of the more commonly employed chemical methods. Such a comparison will demonstrate that the percentage results by the microanalytical methods are fully as accurate as the percentage results by the usual chemical test and analyses, as carried out by analysts of about equal qualification and experience.

1. *Cinchona Bark.*—Reduce an absolutely pure average sample of *Cinchona Ledgeriana* and of *C. succirubra* to a No. 80 powder. Make suspensions in the manner already explained and by means of the special counting chamber determine the average number of bast cells per field. Take the average of not less than fifty counts of not less than two mounts. The average of the counts thus obtained represents the number of bast cells in a pure 100 percent cinchona bark. The individual bast cells should be counted. Thus a group of three bast cells should be counted as three. No attention is given to the bark parenchyma cells nor to the sparingly present sclerenchyma cells. In this particular exercise the percentage difference of the counts by the students should not exceed 1 percent.

Make percentage mixtures of cinchona bark, using absolutely pure *Rhamnus purshiana* bark as the admixture. The rhamnus bark must be reduced to the same fineness as the cinchona bark and the mixing must be thorough. Make three admixtures. One of fifty parts of cinchona bark and fifty parts of rhamnus bark; the second mixture of seventy-five parts cinchona and twenty-five parts rhamnus; the third mixture of ninety parts cinchona and ten parts rhamnus. The usual suspensions of these several mixtures are made and the counts made as for part one of this exercise. The results should be compared and discussed. Keep the admixtures for problem two.

2. *Rhamnus Purshiana Bark.*—Prepare an absolutely pure average sample of *Rhamnus purshiana* bark as for cinchona and make a count of the bast tissue, counting each group of bast cells as one. The sclerenchyma cells (individuals and groups) are not counted as they are rather difficult to recognize and the counts based thereon would only cause confusion and would give widely varying results.

Use the mixtures prepared for the cinchona counts and from the counts obtained determine the percentages of rhamnus bark present. Do not ascertain

the rhamnus percentages by merely utilizing the counts of the cinchona bast cells as obtained from problem one. Compare the errors in the two problems from the same admixtures and it will be found that the variation in results will be somewhat greater for problem two, although the error should not exceed 3 percent, even for beginners in this kind of work.

3. *Senna Leaflets.*—Prepare two samples. One of pure whole or broken leaflets of *Cassia angustifolia* and one of pure whole or broken leaflets of *Cassia acutifolia*. Make the 1–5 suspensions and determine the number and the length of the simple single-celled trichomes present. In the *C. angustifolia* the trichomes are fewer and longer as compared with those of *C. acutifolia*. Also search for epidermal tissue fragments and note the number and size of the neighboring cells of the stomata in the two varieties of sennas.

Make a fifty to fifty admixture of the two sennas and determine the amount of each kind of senna, based upon the count of the trichomes, utilizing the following suggestion. The count of those trichomes which exceed in length the longest cells of the *C. acutifolia* represent *C. angustifolia* (100 percent). In this exercise the differences in result will be found to be considerable.

Make admixtures of each of the two samples with wheat flour and determine the amount of such admixture from the trichomatic counts. In this case the difference in the results should be slight. This particular problem will serve as a preparation for problem ten.

Make admixtures of pure senna leaflets and of senna stems and make percentage determinations; likewise of senna pods and of senna leaflets.

4. *Insect Powder.*—Secure samples of pure flower heads of the three species of pyrethrum (*Chrysanthemum roseum*, *C. Marshalli* and *C. androseamifolium*), both the fully expanded flower heads and the partially expanded heads, making six samples. The thoroughly dried flower heads are reduced to a No. 80 powder and the counts are made of the pollen grains (mature and immature) and of the groups of the sclerenchyma cells and also of the groups of fibrous tissue. The trichomes and the somewhat papillose epidermal cells have a diagnostic significance only. The counts thus obtained should be carefully made and the results recorded for future reference and use.

Prepare a powder of the stems of one of the species of insect flower and make a careful count of the groups of the fibrous tissue present. A few pollen grains will also be noted. The count of the groups of fibrous tissue represents a 100 percent stem tissue. Now make admixtures of pure insect powder and pure stem tissue, and from a count of pollen as well as of the stem tissue, ascertain the amount of the several admixtures. A whole series of problems will suggest itself and should be tried out as time and opportunity will permit. The sclerenchyma group count and mature pollen grain count will indicate the percentage amount of mature flower heads used. What is the number of pollen grains per gramme in a 100 percent insect powder?

5. *Digitalis Leaves.*—Secure samples of the leaves from the first year plants, and from the second year plants at the time of flowering. Dry, powder and prepare for the count as the above samples. Make counts of the simple trichomes. In the first year plants the leaves will show fewer trichomes. What are the total trichomatic counts for the first year leaf and for the second year leaf? Also make a count of the groups of fibrous tissue in the two samples of leaf.

Prepare samples of digitalis stems and make counts of the trichomes and of the groups of fibrous tissue. Make fifty to fifty admixtures of digitalis leaf and of digitalis stem and redetermine the amount of leaf and of stem, respectively, based upon the trichome count and also upon the count of the groups of fibrous tissue.

Digitalis leaf (in the powdered form) is identified by the simple and the glandular trichomes. The cells of the simple trichomes are more or less collapsed, usually one cell is flattened in one plane, the cell following being collapsed in a

plane at right angles to that of the other. The glandular trichomes usually bear two terminal secreting cells. In making the counts of the trichomes, all trichomatic fragments, distinctly recognizable as such, are to be counted as one, and it is important that all of the comparative counts be made of powders of the same degree of fineness. The percentage estimates based upon the counts of the first year and the second year leaves will be quite variable and will show wide ranges in results.

6. *Glycyrrhiza.*—Prepare samples of pure average samples of the peeled and the unpeeled licorice, and of licorice trimmings. Counts are made of the yellowish groups of fibrous tissue, especially of the groups of crystal-bearing fibers. The starch count may be ignored. In the case of the unpeeled licorice a count is to be made of the dark brown cork tissue elements. The following counts are to be made of the three samples.

a. The number of cork tissue elements and groups of such elements in the unpeeled licorice; also a count of the yellow fibrous tissue and crystal-bearing tissue groups.

b. The fibrous and crystal-bearing groups in the peeled licorice.

c. The number of fibrous tissue groups in the licorice trimmings.

Make admixtures of the pure licorice and of the licorice trimmings and determine the percentages of the admixtures from the results of the counts. The results of the counts will again be utilized in exercise ten.

7. *Sublimed Sulphur.*—Examine carefully samples of pure sublimed and of precipitated sulphur and note the microscopic differences. Make careful percentage admixtures of sublimed sulphur in plain vaseline and from such admixtures make the counts of the sulphur particles. A 1, 5 and a 10 percent mixture should be counted. If it is found that the sulphur particles are too numerous to permit counting then dilutions must be made and the percentages redetermined from a carefully prepared vaseline suspension. How many particles of sublimed sulphur in one gramme? The results of the counts are to be used in exercise ten.

8. *Black Pepper.*—Four substances are required; an average commercial sample of pure whole black pepper; an average commercial sample of whole white pepper; a sample of whole pepper known in the trade as "grinding peppers;" and a sample of "black pepper refuse" (consisting of pepper stems, tailings and screenings). These several samples are to be reduced to the same degree of fineness and the following counts made:

a. Of the black pepper, the dark to nearly black fragments and groups, consisting entirely of the pericarp tissue; and the colorless tissue fragments (starch-bearing) consisting wholly of the endosperm tissue elements. The counts represent 100 percent black pepper.

b. Of the white pepper. The dark fragments derived from the pericarp tissue are identical with those of the black pepper. They are sparingly present; and the colorless tissue fragments (starch-bearing) consisting wholly of the endosperm tissue. The two counts together represent 100 percent white pepper.

c. Of the "grinding peppers," make the counts as for black pepper, and compare with the counts for black pepper.

d. Of the black pepper refuse, make the count of the black tissue groups and the groups of fibrous tissue.

Admixture of black pepper and of black pepper refuse are to be made and the percentages of the admixtures redetermined from the counts. "Grinding peppers" will show an excess of pericarp tissue. Pepper adulterated with refuse will also show an excess of pericarp tissue, but in addition will show groups of fibrous tissue derived from pepper stems.

Admixtures of pepper and other substances which are frequently employed as adulterants, such as cereal, cornmeal, ground olive pits, etc., may be made and the percentage adulteration redetermined from the counts.

9. *Mustard.*—Three substances are required. Ground mustard (either white or black) of known purity; ground turmeric of known purity; and wheat flour. No count is to be made of the mustard, as it reveals no structure upon which a percentage count could be based. Make the following counts. A count of the yellow starch clusters of turmeric; and a count of the starch granules of the starch-bearing tissue groups of the wheat flour.

Make admixtures of mustard and of wheat flour, adding from one to five percent of turmeric, and from the counts redetermine the percentages of the admixtures.

The following addition should be made to this problem: Make counts of 100 percent ground mustard hulls, and from admixtures of mustard and of mustard hulls, redetermine the percentages of the admixtures.

10. *Compound Licorice Powder.*—This substance contains powdered sugar, the count of which can be made from an alcohol or oil mount; or, the counts of all of the ingredients may be made from a vaseline suspension. Of course it will be necessary to make a separate count of a pure sample of powdered sugar. In so doing it should be kept in mind that most of the powdered sugar of the market contains a small amount of corn starch. The amount of corn starch present should be determined according to the method given elsewhere in this paper. The following counts are to be made:

a. A count of the licorice tissue upon which the percent of licorice is based. Is the licorice of the peeled or of the unpeeled variety?

b. A count of the sulphur particles present.

c. In case anise is used as the flavoring agent, instead of the oil of anise, then a separate count must be made of a pure sample of anise in order that the percentage amount in the compound powder may be ascertained.

d. A count of the sugar particles present.

The reconstructed formula based upon the results of the several counts should be closely similar to that of the actual pharmacopoeial percentages composition.

The microscopes used by the students must be standardized to the same magnification and the same area of the field of view. In each instance it must be stated as to whether the high or the low power was used in making any given count or sets of counts. In most instances the low power will suffice. For making starch counts and counts of similar minute particles the high power must be used.

The following is a list of vegetable drugs and spices giving the microscopical characteristics of each substance named upon which the percentage counts are to be based. When more than one histological element is named, the first is the one considered the most important for the purpose of making the counts. The other elements may be used for check purposes. The structural elements proposed for purposes of making the percentage counts, are not necessarily also the more important for purposes of identification, and in many instances that combination of tissues and of tissue elements which will unmistakably identify the drug or spice, is of little value for the purpose of the percentage determination. It will be found that some vegetable drugs reveal no special identifying microscopic structures, as belladonna leaves, stramonium leaves, spigella roots and rhizomes, cypripedium roots and rhizomes, lappa roots, fennel, caraway, and others. For this very reason added adulterants are all the more readily recognized as these usually reveal some distinctive microscopical characteristic. In such cases the percentage counts are made of the adulterants and the result subtracted from the total amount, leaving the percentage of the drug or spice itself. Belladonna, for example, is

frequently adulterated with phytolacca, and the adulteration is at once recognized by the very characteristic scattering acicular crystals of phytolacca, but these diagnostic structures are of no value for making percentage determinations. On the other hand, ground olive pits, which are so frequently used for the purpose of adulterating spices, nutgall and other drugs, are not only readily recognized but are ideal for the purpose of making exact percentage counts.

LIST OF SUBSTANCES WITH MICROSCOPICAL STRUCTURES UPON WHICH THE PERCENTAGE COUNTS ARE TO BE BASED

1. Absinthium.—T-shaped trichomes.
2. Aconite leaf.—Trichomes. Sclerenchyma cells.
3. Aconite root.—Sclerenchyma cells. Starch aggregates.
4. Amygdala.—Sclerenchyma cells (for unblanched almonds only).
5. Amylum.—Size, form, markings, position of hilum, etc.
6. Anisum.—Trichomes.
7. Asclepias.—Groups of sclerenchyma cells.
8. Aspidium.—Resin particles. Starch. Scalariform ducts.
9. Aspidosperma bark.—Large sclerenchymatous bast cells.
10. Belladonna leaf.—Trichomes? Cells with microcrystalline calcium oxalate.
11. Belladonna root.—Starch? Cells bearing microcrystalline calcium oxalate? Ducts?
12. Berberis.—Sclerenchymatous bast cells.
13. Caffea.—Sclerenchymatous bast cells. Endosperm cells.
14. Calendula.—Trichomes. Pollen.
15. Calumba.—Sclerenchyma cells. Starch. Ducts.
16. Canella.—Groups of sclerenchyma cells.
17. Cannabis.—Simple trichomes.
18. Capsicum.—Color and characteristic epidermal elements.
19. Carbo.—Size and number of black particles.
20. Caryophyllus.—Bast cells. Color of tissue fragments.
21. Cascarilla.—Bast cells.
22. Chamaelirium.—Bast cells.
23. Cinchona.—Large bast cells.
24. Cinnamon.—Bast cells. Sclerenchyma cells.
25. Coca.—Fragments of the lower epidermis.
26. Colchicum corm.—Starch granules. Spiral ducts.
27. Convallaria.—Number of raphides.
28. Cornus.—Groups of sclerenchyma cells.
29. Coto bark.—Bast and sclerenchymatous groups.
30. Crocus.—Pollen grains and colored tissue.
31. Cubeb.—Groups of sclerenchyma cells and of endosperm cells.
32. Curcuma.—Number of yellow particles (agglutinated starch).
33. Cusso.—Pollen. Simple and glandular trichomes.
34. Cypripedium.—Number of raphides.
35. Dextrine.—As for starch. Recognizable starch granules.
36. Digitalis.—Non-glandular trichomes.
37. Eriodictyon.—Non-glandular trichomes.
38. Euonymus stem bark.—Bast cells. Aggregate crystals.
39. Eupatorium.—Trichomes. Pollen grains.
40. Galla (Chinese).—Trichomes.
41. Gentian.—Fragments of large reticulate ducts.
42. Glycyrrhiza.—Groups of yellow tissue with crystal-bearing fibers. Cork tissue in unpeeled licorice. Fibrous tissue of trimmings.
43. Gossypium.—Bast. Fibrous tissue groups.
44. Haematoxylon.—Colored tissue. Reaction with copper solution.
45. Hamamelis.—Trichomes. Sclerenchyma cells.

46. Hyoscyamus.—Non-glandular trichomes.
47. Ipecac.—Raphides. Fibrous tissue. Starch.
48. Iris florentina.—Starch. Crystals.
49. Jalap.—Resin-bearing cells. Starch.
50. Kamala.—Glands and trichomes.
51. Krameria.—Bast cells and groups of bast.
52. Lobelia.—Trichomes and groups of fibrous tissue.
53. Lupulin.—Number of glandular structures.
54. Lycopodium.—Number of spores.
55. Mezereum.—Number of bast fragments.
56. Nux vomica.—Trichome fragments and groups of endosperm tissue.
57. Paracoto.—As for coto.
58. Physostigma.—Starch granules.
59. Phytolacca.—Number of raphides.
60. Pimenta.—Groups of sclerenchyma cells and trichomes.
61. Piper, black.—Groups of endosperm cells and of pericarp tissue.
62. Piper, white.—Groups of endosperm cells.
63. Prunus serotina.—Bast and sclerenchyma.
64. Prunus virginiana.—Bast.
65. Pyrethrum flowers.—Pollen grains. Sclerenchyma. Fibrous tissue.
66. Quillaja.—Bast and crystals.
67. Rhamnus purshiana.—Groups of bast and crystal-bearing fibers.
68. Rheum.—Aggregate crystals. Ducts. Colored tissue.
69. Sarsaparilla.—Number of raphides. Ducts. Starch.
70. Sassafras.—Bast. Groups of sclerenchyma cells.
71. Scopola.—As for belladonna leaf and root.
72. Senna.—Trichomes. Neighboring cells.
73. Stramonium.—Non-glandular trichomes.
74. Strophantus.—Trichomes.
75. Tabacum.—Glandular and non-glandular trichomes.
76. Thea.—Trichomes and sclerenchyma cells.
77. Viburnums.—Bast, and bast and sclerenchyma cells.
78. Zingiber.—Starch granules. Cork tissue.

COLLEGE OF PHARMACY,
UNIVERSITY OF NEBRASKA,
LINCOLN, NEBRASKA,
April 4th, 1920.

THE CHEMISTRY OF THE HEPTANE SOLUTION.

BY EDWARD KREMERS.

3. PURIFICATION OF HEPTANE AND ITS PHYSICAL CONSTANTS.

BY DR. C. L. SHERK.

(*Concluded from November Number, p. 1052.*)

II. PHYSICAL CONSTANTS OF PURIFIED HEPTANE.

1. Boiling Point.

For the final determination of the boiling point the constant pressure apparatus constructed by Professor Mathews[24] was used under the direction of Dr. A. E. Koenig.

The boiling point of water as registered by the thermometer employed is 99.96°. Accordingly there is positive correction to be made on all subsequent readings of 0.04°.

Heptane Purified by Iodine.—The run was made on about 300 Cc. in every case and, as this was the first of a series, the heptane was kept boiling gently for one-quarter hour to establish again equilibrium in the thermometer. These five runs were made on the same day and the time in the tables gives the order in which they were actually made. The flask after each determination was emptied and a stream of air passed through to remove vapors. A small quantity of the next sample was used to wash out the flask before the run was made. The distillates were collected for every 0.05° rise in temperature.

The boiling range of this sample was 0.52°. This sample was kept gently boiling for 15 minutes; accordingly there was some loss by vaporization and the amount recovered was somewhat lower than in the other cases where distillation proceeded at once. The run was made on 300 Cc. at 7 amperes.

Time.	Temperature. Degrees.	Remarks.	Volume of distillate.	Time.	Temperature. Degrees.	Remarks.	Volume of distillate.
7:04	.....	Boiling began		7:23	98.30		54
7:05	98.00	Pressure on		7:24	98.30		
7:06	98.10			7:25	98.30		
7:07	98.13			7:26	.....		
7:08	98.16			7:27	98.31		
7:09	98 16			7:28	98.32		
7:10	98.17			7:29	98.32		
7:11	98.18			7:30	98.33		
7:12	98.20		47	7:31	98.34		
7:13	98.20			7:32	98.34		
7:14	98.20			7:33	98.33		
7:15	98.20			7:34	98.35		76
7:16	98.23			7:35	98.36		
7:17	98.25		37	7:36	.....		
7:18	98.25			7:37	98.37		
7:19	98.27			7:38	98.38		
7:20	98.29			7:39	98.38		
7:21	98.29			7:40	98.40		
7:22	98.29			7:41	98.40	Done	37
				7:42			—
							Recovered, 251

Heptane Purified by Hydrogen Iodide.—This sample had a boiling range of 0.23°. The run was made on 300 Cc. at 7 amperes.

Time.	Temperature. Degrees.	Remarks.	Volume of distillate.	Time.	Temperature. Degrees.	Remarks.	Volume of distillate.
8:06	.....	Boiling began		8:29	98.28		
8:07	97.90	Pressure on		8:30	98.30		70
8:08	.....			8:31	98.30		
8:09	98.07			8:32	98.30		
8:10	98.10			8:33	99.30		
8:11	98.12		25	8:34	98.31		
8:12	98.17			8:35	98.32		
8:13	98.18			8:36	98.32		
8:14	98.19			8:37	98.32		
8:15	98.20		17	8:38	.....		
8:16	98.20			8:39	98.32		
8:17	98.22			8:40	98.33		
8:18	98.22			8:41	98.34		
8:19	98.23			8:42	98.35		80
8:20	98.25		39	8:43	98:36		

8:21	.....	8:44	98.37		
8:22	98.24	8:45	98.37		
8:23	98.25	8:46	98.38		
8:24	98.27	8:47	98.38		
8:25	98.28	8:48	98.40		53
8:26	98.28	8:50		Done	
8:27	98.29				—
8:28	98.29				Recovered, 284 Cc.

Heptane Purified by Hydrogen Chloride.—This is the first sample the boiling range of which is 0.34°. The run was made on about 300 Cc. and the heptane was kept boiling gently for one-half hour, to establish equilibrium in the thermometer. The run was made on 280 Cc. at 7 amperes.

Time.	Temperature. Degrees.	Remarks.	Volume of distillate.	Time.	Temperature. Degrees.	Remarks.	Volume. of distillate.
2:19	.....	Boiling began		3:18	98.30		
3:00	.....	Pressure on		3:19	98.30		
3:01	98.18			3:20	98.31		
3:02	98.18		8	3:21	98.31		
3:03	98.20		17	3:22	98.33		
3:04	98.22			3:23	98.33		
3:05	98.23			3:24	98.34		
3:06	98.24			3:25	98.34		
3:07	98.24			3:26	98.35		
3:08	98.25		80	3:27	98.34		
3:09	98.26			3:28	98.36		85
3:10	98.27			3:29	98.36		
3:11	.....			3:30	98.36		
3:12	98.28			3:31	98.38		
3:13	98.28			3:32	98.39		
3:14	98.30			3:33	.....		
3:15	98.30		50	3:34	98.40		
3:16	98.30			3:35		Done	
3:17	98.30						—
							Recovered, 230 Cc.

The following table is taken from data on previous runs obtained after the still had been in operation for more than an hour. The sample represents this first purification with hydrogen chloride and the run was made on the usual 300 Cc. at 7 amperes.

Time.	Temperature. Degrees.	Remarks.	Volume of distillate.	Time.	Temperature. Degrees.	Remarks.	Volume of distillate.
4:28	98.00	Pressure on		4:44	98.30		
4:29	98.10		13	4:45	98.30		98
4:30	98.14			4:46	98.32		
4:31	98.16			4:47	98.30		
4:32	98.20		32	4:48	98.32		
4:33	98.20			4:49	98.34		
4:34	98.22		34	4:50	98.30		
4:35	98.25			4:51	98.35		60
4:36	.....			4:52	98.37		
4:37	98.28			4:53	98.38		
4:38	98.29			4:54	98.39		
4:39	98.30			4:55	.....		
4:40	98.30			4:56	98.40		48
4:41	.....			4:57			
4:42	98.30					Done	7
4:43	98.30						—
							Recovered, 292 Cc.

From the tables it becomes apparent that the heptane boils constantly within limits of temperature of 0.10° and the constant temperature, 98.30° in both cases, may be taken as the boiling point of this sample of heptane.

This represents the second sample prepared by this method. It had a boiling range of 0.28°.

Time.	Temperature. Degrees.	Remarks.	Volume of distillate.	Time.	Temperature. Degrees.	Remarks.	Volume of distillate.
3:59	.....	Boiling began		4:20	.....		
4:00	97.90	Pressure on		4:21	98.28		
4:01	97.98			4:22	98.30		40
4:02	98.03			4:23	.....		
3:03	98.07			4:24	98.30		
4:04	98.10			4:25	98.30		
4:05	98.10			4:26	98.30		
4:06	98.12			4:27	98.30		
4:07	98.14			4:28	98.31		
4:08	98.16			4:29	98.31		50
4:09	98.16			4:30	.....		
4:10	98.17			4:31	98.32		
4:11	98.18			4:32	98.32		
4:12	98.20		88	4:33	98.34		
4:13	98.20			4:34	98.34		
4:14	.....			4:35	98.35		52
4:15	98.21			4:36	98.37		
4:16	98.23			4:37	98.38		
4:17	98.25		46	4:38		Done	
4:18	98.27						——
4:19	98.27						Recovered, 276 Cc.

This sample, taken from a different portion of the original lot, also boils within close limits having a constant value at 98.30°.

Heptane Purified by Antimony Trichloride.—The sample had a boiling range of 0.38°. The run was made on 300 Cc. at 7 amperes.

Time.	Temperature. Degrees.	Remarks.	Volume of distillate.	Time.	Temperature. Degrees.	Remarks.	Volume of distillate.
9:18	.....	Boiling began		9:39	98.30		
9:19	.....	Pressure on		9:40	98.30		
9:20	98.11			9:41	98.30		43
9:21	98.15			9:42	98.31		
9:22	98.18			9:43	98.32		
9:23	98.20		32	9:44	98.32		
9:24	98.20			9:45	98.33		
9:25	98.20			9:46	98.33		
9:26	98.20			9:47	98.34		
9:27	98.22			9:48	98.33		
9:28	98.23			9:49	98.35		55
9:29	98.24			9:50	98.37		
9:30	98.25		55	9:51	98.37		
9:31	98.26			9:52	98.37		
9:32	98.28			9:53	98.38		
9:33	98.28			9:54	98.39		
9:34	.....			9:55	98.40		
9:35	98.29		50	9:56	98.41		55
9:36	98.30			9:57		Done	
9:37	98.30						——
9:38	98.30						Recovered, 290 Cc.

A previous run made on the same sample of heptane when the still had been in use for hours gave the following table on the usual quantity—300 Cc. at 7 amperes.

Time.	Temperature. Degrees.	Remarks.	Volume of distillate.	Time.	Temperature. Degrees.	Remarks.	Volume of distillate.
5:18	.....	Boiling began		5:32	98.28		
5:19	98.00	Pressure on		5:33	.....		
5:20	98.10		8	5:34	98.29		
5:21	.....			5:35	98.30		
5:22	98.20		13	5:36	98.31		
5:23	98.20			5:37	98.31		
5:24	98.20			5:38	98.31		
5:25	98.20			5:39	98.31		112
5:26	98.21			5:40	98.32		
5:27	98.23			5:41	98.35		
5:28	98.23			5:42	98.38		
5:29	98.24			5:43	98.39		
	98.25		107	5:44	98.40		48
5:30	98.26			5:45	98.42	Done	7
5:31	98.27						
							Recovered, 295 Cc.

It will thus be seen that in both cases a very large proportion came over within 0.10° with the temperature remaining constant at 98.30° and 98.31°, respectively.

Heptane Purified by Bromine and Hydrogen Bromide.—This sample is of a much lower degree of purity than any of the preceding and is included here because the values of some of its other physical properties are included in the tables.

The run was made on a portion, having a boiling range, of about 1.0°, and a quantity of 300 Cc. with a current of 7 amperes.

Time.	Temperature Degrees.	Remarks.	Volume of distillate.	Time.	Temperature. Degrees.	Remarks.	Volume. of distillate.
4:13	97.90	Pressure on		4:36	98.40		
4:16	98.10		7	4:37	98.40		61
4:20	98.20		32	4:38	98.43		
4:24	98.25		30	4:40	98.45		
4:26	98.30			4:42	98.50		52
4:27	98.30			4:44	98.57		
4:29	98.30		58	4:45	98.62		
4:30	98.32			4:46	98.70		
4:31	98.36			4:47	98.90		
4:33	98.37			4:48	99.15		
4:34	98.39			4:49	100.00		53
4:35	98.39						
							Recovered, 293 Cc.

There are indications that with more care in fractionation this sample would have shown the same characteristic boiling temperature as the others.

These results indicate that there is remarkable uniformity in the product obtained by the various methods of purification. In every case there is obtained a constant temperature of 98.30° at which the boiling point remains fixed for minutes at a time. This value becomes 98.34°, when the correction obtained for the boiling point of water is applied.

The following more exact determinations of the boiling point of normal heptane have been made by various observers:

Boiling point.	Observer.	Source.
98.42 to 98.43°[a]	T. E. Thorpe[2,10]	*Pinus Sabiniana.*
98.4°	Sydney Young[11]	Reduction of normal heptyl bromide.
98.25 to 98.45°	Sydney Young[12]	"Petroleum ether" from Am. petroleum.
97.33°[b]	R. E. Kremers[1]	*Pinus Sabiniana.*
98.56 to 98.57°[c]	W. A. Gruse[13]	*Pinus Jeffreyi.*
98.34°[c]	Sherk	*Pinus Jeffreyi.*

[a] Barometric pressure corrected to 760 mm. and temperature reduced to 0° C.
[b] Barometric pressure corrected but not reduced.
[c] Constant pressure apparatus.

2. Density.

In all the density determinations weighings were made with a set of weights which had been calibrated by direct comparison with weights standardized by the Bureau of Standards. The weights were compared on both pans of the balance and calculations made by the method of swings and determination of the sensitiveness of the balance for the several loads.

The pyknometers were of the Ostwald-Sprengel type and comparisons were made with one of a capacity of about 50 Cc. The caps fitted tightly. The pyknometer was carefully cleaned and steamed out. Water which had been distilled from permanganate and condensed in tin was afterwards boiled before using to standardize the pyknometer. All weights are corrected and were made by double weighing using as a tare a pyknometer of equal size. Determinations were made by refilling and checks obtained in the weighings to 2 mg. The tare was treated like the other pyknometer by being introduced into the bath and wiped dry in the same manner and allowed to hang in the balance case the same length of time.

The pyknometer was allowed to remain in the bath one-half hour until all movement of the liquid had ceased. The bath was kept at 20° C. within less than ±0.03°. After cleaning, the pyknometer stood a day to give time for readjustments to take place in the glass. For a change of sample, air filtered through a plug of cotton was aspirated through the pyknometer.

For density determination at 0° the most uniform sample of purified heptane was chosen and only this one value obtained. A bulb was blown in one arm of the pyknometer to allow for expansion. This bulb was so shaped and its outlet so inclined that it readily drained on cooling, and no heptane would rise in the capillary beyond until the bulb filled. The leak was very slight as one determination showed after pyknometer had stood several hours.

For the temperature regulation finely powdered ice was packed into a large funnel and the instrument immersed and left until no movement took place in the capillary tube. The bulb was then completely drained by tilting and final adjustment made.

In the comparative determinations the fractions of heptane chosen are indicated. The heptane was standing over sodium.

The most satisfactory value of the series was that for the purification with

hydrogen chloride; accordingly the density of 20° and 0° was reduced to vacuo by using the formula[14]

$$M\sigma\left(\frac{1}{\Delta}-\frac{1}{p}\right)=MK,$$

where M = apparent mass in grammes of body in air,
σ = density of air,
Δ = density of body,
p = density of weights.

The data used were for heptane at 20°:
apparent weight of heptane = 35.8320 grammes,
apparent weight of water = 52.3346 grammes.

The correction (K) is determined for weights used and the density of the substance weighed, but σ is taken as the average density or 0.0012. In the calculations the value of this correction factor (K) was obtained from the actual density[15] of the air at the time of weighing. The following values were obtained:

corrected weight of heptane = 35.8912 grammes,
corrected weight of water = 52.4189 grammes.

The density of heptane at 20°/20° is

$$\frac{35.8912}{52.4189}=0.68469.$$

The values for two other temperatures were also obtained, reducing the weights to vacuo in each case:

$d_{20°/20°}$	0.68469
$d_{20°/4°}$	0.70075
$d_{0°/4°}$	0.70192

TABLE OF COMPARATIVE DENSITY.

Heptane purified by	Boiling point. Degrees.	Density at 20°.	Average.
Iodine	98.20 to .35	0.684598	
		0.684586	0.68459
Hydrogen iodide	98.25 to .35	0.684687	
		0.684703	0.68469
Hydrogen chloride	98.20 to .30	0.684644	
		0.684627	0.68464
Hydrogen chloride	98.25 to .30	0.684687	
		0.684657	0.68467
Antimony trichloride	98.25 to .30	0.684722	
		0.684667	0.68469
Bromine and hydrogen bromide	98.25 to .40	0.684894	
		0.684873	0.68488

The following table gives the results of other observers on the determination of the density of heptane:

	Density.	Observer.	Source.
$d_{0°/0°}$	0.70057	Thorpe[2]	*Pinus Sabiniana.*
$d_{0/4}$	0.70048	Thorpe[10]	*Pinus Sabiniana.*
$d_{15/15}$	0.68838	Thorpe[16]	*Pinus Sabiniana.*
$d_{15/15}$	0.68851	Perkin[16]	Thorpe's sample.
$d_{25/25}$	0.68142	Perkin[16]	Thorpe's sample.
$d_{0/4}$	0.70048	Young[11]	American petroleum.
$d_{0/4}$	0.70186	Young[11]	Normal heptyl bromide.
$d_{0/0}$	0.6984	Kijmer[17]	Oxidation of fatty hydrazine.

	Density.	Observer.	Source.
$d_{/15}$	0.6863	Blasdale[18]	*Pinus Jeffreyi.*
$d_{/15}$	0.6840	Blasdale[18]	*Pinus Sabiniana.*
$d_{/20}$	0.68288	Kremers[1]	*Pinus Sabiniana.*
$d_{/40}$	0.66623	Kremers[1]	*Pinus Sabiniana.*
$d_{20/4}$	0.6932	Faville[10]	*Pinus Jeffreyi.*

3. *Index of Refraction.*

This constant was measured by the Pulfrich refractometer. The measurements were made at 20° and at every setting of the instrument a temperature reading was taken. Care is necessary in the adjustment of the temperature because of the high coefficient of expansion of heptane. Water was used as a standard. A quantity prepared for conductivity measurements was used.

Measurements were made on two separate portions of the liquid under examination. The cell was filled with a pipette and readings taken. Then the liquid was withdrawn in the same manner and the cell dried with filter paper. A second portion was introduced and a new series of readings obtained. The sodium flame was used in this determination. Settings were made repeatedly and readings taken until a series of five had been obtained for each portion.

The value obtained for the refractive index for water is $n_{20°} = 1.33279$.

Heptane purified by	Fraction. Degrees.	Angle of refraction.	Refractive index, 20°.
Iodine	98.25 to .35	56° 30.9′	1.38737
Hydrogen iodide	98.25 to .35	56° 30.7′	1.38739
Hydrogen chloride	98.25 to .30	56° 31.1′	1.38735
Antimony trichloride	98.25 to .30	56° 30.6′	1.38740
Bromine and hydrogen bromide	98.25 to .40	56° 30.7′	1.38739

In order to determine the effect of such narrow fractionation upon the refractive index, the indices of every fraction obtained from the first sample of hydrogen chloride purification were determined in the same manner; and the following series of results was obtained:

Fraction. Degrees.	Angle of refraction.	Refractive index.
98.10 to .20	56° 31.0′	1.38736
98.20 to .25	56° 31.0′	1.38736
98.25 to .30	56° 30.95′	1.38737
98.30 to .35	56° 31.4′	1.38733
98.35 to .40	56° 30.6′	1.38740

Thus it is apparent that the differences are very slight, and the values obtained for the different methods of purification as well as those for a series of fractions are very nearly constant.

The values which have been obtained by other observers are given below.

	Index of refraction.	Method.	Observer.	Source.
n_D	1.3879	Horizontal goniometer	Thorpe[2]	*Pinus Sabiniana.*
$n^{15°}$	1.3887	.....	Blasdale[18]	*Pinus Sabiniana.*
$n^{15°}$	1.3905	.....	Blasdale[18]	*Pinus Jeffreyi.*
$n^{20°}$	1.3895	Abbé	Kremers[1]	*Pinus Sabiniana.*
$n_D^{20°}$	1.38776	Pulfrich	Faville[19]	*Pinus Jeffreyi.*

4. *Dispersion.*

A hydrogen tube was used and settings were made on the (C) and the (G) lines. The distance between the lines was determined by the vernier and settings

were made and readings taken by first rotating the vernier in one direction for one reading and in the reverse direction for the second reading. Thus a series of concordant values for the distance was obtained by taking five or six such alternate readings. The temperature was accurately controlled as in the previous cases at 20° by observing the thermometer at the time of each setting.

Results are calculated on the values obtained for the sample of hydrogen chloride purified heptane boiling between 98.25° and 98.30°. This was again chosen as the most representative sample. However, values for the corresponding fractions of iodine purified heptane and the purification by antimony chloride are included as well, to show that the variations among the samples are very slight.

Sample.	Fraction. Degrees.	Angle for (C) line.	Angle for (G) line.	Difference by vernier.
Hydrogen chloride	98.25 to .30	55° 48.8′	58° 6.5′	2° 18.4′
Hydrogen iodide	98.25 to .30	55° 49.5′	58° 6.5′	2° 18.2′
Antimony trichloride	98.20 to .30°	55° 49.5′	58° 6.5′	2° 18.0′

From these results the molecular refractions for the two hydrogen lines are obtained. The values for the sodium line are included here. The calculated values are obtained from the atomic refractions of the elements. The formula of Lorentz and Lorenz was used:

$$M R = \frac{n^2 - 1}{n^2 + 2} \cdot \frac{M}{d}$$

where R represents the refractions,
M represents the molecular weight of the substance,
n represents the index of refraction, and
d represents the density of the substance under the conditions of the observations.

Heptane purified by	Molecular refraction. C.	D.	G.	Molecular dispersion.
Hydrogen chloride	34.294	34.395	35.763	1.469
Hydrogen iodide	34.295	34.395	35.763	1.468
Antimony trichloride	34.296	34.395	35.763	1.467
Calculated	34.203	34.323	35.052	0.849

5. *Viscosity.*

The method used was that described by Ostwald[20] and is the very familiar method. A definite amount of liquid is allowed to flow through a capillary tube, and the time taken for it to flow between the two marks noted. This time is then compared with the time of outflow of a liquid whose viscosity is known, or whose relative viscosity is taken as unity. Since the height of the column of liquid is the same, correction will have to be made only for the difference in the densities of the two liquids.

Water was used as a standard here, as its absolute viscosity has been carefully measured, and its purity is easily checked. The absolute viscosity of water is taken to be 0.01007 dyne per sq. cm. at 20° C. This value is obtained by interpolation of the results of Thorpe and Rodger[21,22] for the absolute value of the viscosity of water. The relative values obtained by the Ostwald method by taking the viscosity of water as unity are then multiplied by this factor to give the value in absolute units.

Throughout the work the temperature was controlled to within ±0.03° and the thermostat with glass sides was employed as for density determinations, and

was regulated at 20°. Especial care is required in the case of heptane whose thermal expansion is great. The time of outflow was recorded by a stopwatch which could be read to 0.1 of a second. Two types of instrument were used. Tube I was the ordinary open form and tube II was the form arranged for volatile liquids. Exactly 4 Cc. of heptane were measured into the viscosimeter with a pipette. Care was taken to allow the pipette to drain for the same length of time and the heptane was at the temperature of the bath.

Eight to twelve readings were taken for each sample. When one set of readings was finished, the other viscosimeter would be ready. Each was emptied and filled a second time and new readings recorded. For a new sample the tube was aspirated carefully using filtered air and a set of readings taken again until two series checked. At the end of all of the series the first sample of heptane was run again and finally water a second time.

With water the time of outflow at the first and last was for instrument II 112.2 and 112.4 seconds; while heptane purified with hydrogen chloride gave with instrument II 54.8 and 54.8 seconds. For a single series the times of outflow for consecutive readings of instrument II were 54.8, 54.8, 54.8, 54.8, 54,8, 54.8, 54.8, 54.9. With tube I the times of outflow in seconds were: 68.0, 67.9, 67.8, 67.9, 68.1, 68.0, 68.0, 68.0. Each set of readings was averaged and that value taken as correct. The values obtained at different times during the work were also averaged as in the case of water and one heptane sample.

Heptane purified by	Fraction. Degrees.	No. of viscosimeter.	Time of outflow. Water.	Time of outflow. Heptane.	Sp. gr. at 20°.	Relative viscosity at 20°.	Absolute viscosity. Dynes cm^2.
Iodine	98.25 to .30	I	112.26	67.94		0.413	0.00416
		II	90.20	54.91	0.68459	0.415	0.00418
Hydrogen iodide	98.25 to .35	I	112.26	67.70		0.414	0.00417
		II	90.20	54.70	0.68469	0.417	0.00420
Hydrogen chloride	98.25 to .30	I	112.26	67.96		0.414	0.00417
		II	90.20	54.80	0.68467	0.416	0.00419
Antimony trichloride	98.25 to .30	I	112.26	67.99	....	0.415	0.00418
		II	90.20	54.78	0.68469	0.416	0.00419

The following values have been obtained by other observers and among them those that are strictly comparable are chosen.

Temperature. Degrees.	Relative viscosity.	Absolute viscosity.	Observer.
20.10	.....	0.004025 dyne.	Thorpe[2]
20.0[a]	.....	0.00410	Thorpe & Rodger[22]
20	0.418	0.00421	Faville[19]
	0.424	0.00426	

[a] The value for this temperature was taken from the curve which accompanied the table.

I wish to express my thanks to Dr. A. E. Koenig for the helpful suggestions which he made in this part of the work.

NOTE ON THE DIELECTRIC CONSTANT.

The value of this constant has been determined for pure heptane by Miss Faville[19] under the direction of Professor Mathews using Drude's second method. The value 1.76 at 20° was obtained compared with benzene which gave a value of 2.258.

Recently Richards and Shipley[23] obtained the value 1.973 for "heptane" compared with that of benzene, 2.286, at 20°. Apparently the authors have attempted to fix the value of this constant by the use of a product derived from petroleum having boiling points anywhere between 96.5° and 100°. They admit, "Probably the result represents an average value for several heptanes;" yet heptane of any desired degree of purity is available for the determination of physical constants and chemical characteristics. The value of the dielectric constant is now being redetermined on pure heptane in Professor Mathews' laboratory.

[1] R. E. Kremers, "A chemical study of Digger's pine oil and of the heptane therefrom." Unpublished thesis, Univ. of Wis., 1915.

[2] *Journ. Chem. Soc.*, 35 (1879), 296.

[3] *Amer. Chem. Journ.*, 20, 202.

[4] W. A. Gruse, unpublished results of the Forest Products Laboratory.

[5] Wm. Rabak, unpublished thesis, Univ. of Wis., 1915, note, p. 14.

[9] Smithsonian Physical Tables, 6th ed., 1914, p. 19.

[10] *Journ. Chem. Soc.*, 37 (1880), 141.

[11] *Ibid.*, 73 (1898), 905.

[12] *Ibid.*, 73 (1898), 917.

[13] Determination by W. A. Gruse; also K. E. Faville, Thesis, Univ. of Wis., 1916.

[14] Kaye and Laby, "Physical and Chemical Constants," p. 19.

[15] Wade and Merriman's Table, *Journ. Chem. Soc.*, 101 (1912), 2429.

[16] By Perkin, *Ibid.*, 45 (1884), 447.

[17] *Journ. f. prakt. Chemie*, 2d Ser., 64 (1901), 127.

[18] *Journ. Am. Chem. Soc.*, 23 (1901), 162.

[19] K. E. Faville, Thesis, Univ. of Wis., 1916.

[20] "Physiko-chemische Messungen," p. 260.

[21] *Proc. Royal Soc.*, 1894.

[22] *Phil. Trans. Roy. Soc.*, 185A (1894), 307.

[23] *Journ. Am. Chem. Soc.*, 41 (1919), 2007.

[24] *Journ. Phys. Chem.*, 22 (1918), 1; see also *Journ. Am. Chem. Soc.*, 36 (1914), 1787; and Richards and Mathews, *Ibid.*, 30 (1908), 1282.

PRACTICAL TESTING OF SPIRIT OF CAMPHOR.

BY A. B. LYONS.

The accurate determination of camphor in an alcoholic solution is not so simple a matter as it would at first appear. If the camphor is of the dextrogyrate variety, the polariscope will quickly solve the problem. But a polariscope does not usually form part of the equipment of a drug store. There is camphor, moreover, that does not affect the polarized ray.

The camphor is easily thrown out of solution by addition of strong saline solutions, and the precipitated camphor is readily taken up by such immiscible solvents as petroleum ether. The amount of camphor is shown by the increase in volume of the solvent. If the quantity of spirit taken for the test is 5 mils, this increase in volume will be, in the case of a standard U. S. P. spirit, 0.5 mil, a quantity not easily read off with an exactness of one part in forty. Every detail of the method as described by Penniman and Randall must be scrupulously adhered to if even this degree of exactness is to be secured, and the method involves the use of a Babcock milk testing outfit. In inexperienced hands, variations considerably greater than 0.25 percent (in a total of 10 percent) may be

expected. If the experiment is made by aid of an ordinary cassia flask, without use of a centrifuge, still greater variations in results are inevitable. I must not be understood as condemning the test, which easily holds first place among the simple assay methods now practiced.

An empirical test of spirit of camphor which has found official recognition in some of the leading pharmacopoeias, notably the German, depends on the quantity of distilled water required to produce incipient precipitation in a given volume of the spirit. For 5 mils of the official (U. S. P.) spirit this quantity is something less than 5 mils. A difference of one-tenth in the quantity of camphor present makes a difference of about 0.3 mil in the volume of water required, so that a variation of 0.2 percent in the camphor content of the spirit is easily shown.

To secure such a degree of exactness, however, the test must be made under prescribed conditions which are to be rigidly adhered to. In the first place, the temperature at which the test is made must be carefully regulated. When water is added to the spirit, the temperature of the mixture rises several degrees. The test should be made at room temperature, which should be preferably near 25° C., at any rate between 20° and 25°.

Five mils of the spirit are measured into a 25-mil Erlenmeyer flask, and distilled water is added from a burette, drop by drop, with constant shaking until the precipitate redissolves somewhat slowly. The flask is then immersed in water kept at a constant temperature of 25° and allowed to remain so during 10 minutes. The addition of water is then continued, drop by drop, until a distinct turbidity is produced which persists a full minute, the flask remaining immersed in the water-bath. The volume of water added is then read off, and the corresponding quantity of camphor is taken out from a table constructed experimentally.

It is essential that the alcoholic strength of the spirit be known. In practice this is brought to a uniform basis by adding to the spirit of camphor to be tested an excess of dried potassium carbonate, which is allowed to act several hours, even though it shows no sign of incipient liquefaction. If the spirit has been made with alcohol of approximately 73 percent strength, as prescribed in the German Pharmacopoeia, it will require addition of the potassium carbonate in successive portions until it ceases to abstract water from the spirit, a considerable quantity of the salt remaining in solid form after several hours of contact with the spirit.

If the spirit proves to be practically free from water (other than the 5 percent, or thereabout, not abstracted by potassium carbonate), the 5 mils to be used for the test are measured out without making allowance for diminution of volume Otherwise the whole of the dehydrated spirit is to be drawn off, with due precautions against loss by evaporation, and the residual potassium carbonate is to be washed with several small portions of alcohol which has been dehydrated by potassium carbonate, these being added to the decanted spirit until this is brought to the original volume of the spirit taken. The result of a determination made in this manner should be trustworthy and sufficiently exact—provided, of course, that the spirit contains no foreign fluid such as acetone.

An alternative plan would be to apply the test to the spirit without preliminary dehydration and determine the percent of alcohol present by the usual method, after throwing out the camphor by the addition of a saline solution. Place in a

50-mil Erlenmeyer flask exactly 10 mils of the sample, add 40 mils of a 20 percent solution of sodium chloride (common salt) in distilled water, filter the solution through a pledget of absorbent cotton into a suitable still and wash the residual camphor with three successive portions (5 mils) of 20% salt solution. Distil slowly to obtain 25 mils [measured, as was the 10-mil sample, at 15.56° C. (60° F.)]. From the specific gravity of the distillate, deduce by reference to U. S. P. alcoholometric table the percent of alcohol present. Multiply this by 2.5 to find the percent of alcohol in the spirit. Multiply this again by 1.111 to find approximately the percent of alcohol in the spirit used to dissolve the camphor, on the assumption that the sample contains 10 percent of camphor. The possible error so introduced is practically negligible.

An approximate estimate of alcoholic strength may be made without distillation by mixing 10 mils of the sample with 41.5 mils of distilled water, shaking well, filtering and taking the specific gravity of the filtrate, which will not differ materially from that of a distillate 5 : 1. The corresponding alcoholic strength found by an alcoholometric table, multiplied by 5.556, will be very nearly the percentage strength of the spirit in which the camphor was dissolved.

The quantity of water required to cause turbidity in a spirit of camphor prepared from alcohol of a strength below 95 percent can be determined only by experiment. The following results were obtained in preliminary tests, which were, however, not made at a carefully regulated temperature, on spirits prepared from alcohol of the strengths specified. Five mils of the spirit were used in each test.

Percent camphor.	Alcohol "absolute." Water.	Alcohol 95%. Water.	Alcohol 90%. Water.	Alcohol 85%. Water.	Alcohol 80%. Water.	Alcohol 75%. Water.	Alcohol 70%. Water.
10	5.25 mils	4.70 mils	4.05 mils	3.45 mils	2.90 mils	2.38 mils	1.45 mils
8	5.25 mils	5.35 mils	4.50 mils	4.05 mils	3.45 mils	2.90 mils	1.80 mils
6	5.25 mils	6.25 mils	5.50 mils	4.85 mils	4.25 mils	3.50 mils	2.40 mils
4	5.25 mils	7.75 mils	6.80 mils	6.25 mils	5.45 mils	4.80 mils	3.50 mils

These approximate figures make clear the fact that we have to deal with two variables, whose effects are not only not mutually compensating but are positively synergistic. While it would be possible to construct an empirical table by which, the alcohol content of a sample of spirit being known, the quantity of camphor present could be deduced from the amount of distilled water required to cause incipient precipitation, yet even so, exact quantitative results would be difficult to reach, and the plan is therefore not to be recommended.

There remains an alternative method which seems to promise good results. Instead of adding water to the spirit of camphor until the solution is slightly supersaturated, we may add the spirit, suitably diluted, to a fixed quantity of water, until this is slightly supersaturated with camphor, as shown by a slight permanent turbidity. We should expect more uniform results from this procedure, first, because there would be little rise of temperature, owing to the very small quantity of alcohol present, and, second, because the proportion of camphor dissolved would vary only slightly, owing to the comparative uniformity in the alcoholic strength of the solvent.

It will be found most convenient to dilute the spirit with 80 percent alcohol so that it shall contain about 2 percent of camphor (not less). (Prepare the 80 percent alcohol by mixing 85.5 mils (at 15.56° C.) with water sufficient to make

at the same temperature 100 mils.) Ten mils of water will require addition of about 1.65 mils of the dilute spirit to produce permanent turbidity, but the spirit must be added quite slowly, a few drops at a time towards the last, with constant shaking. If for distilled water we substitute a 5 percent solution of sodium chloride, the quantity of spirit required will be about 0.8 mil. In this case addition of the spirit must be even more gradual.

A better plan is to place in a small flask 7 mils of distilled water, and add to this slowly one mil of the diluted spirit. Shake the mixture, if turbid, during 1 minute. If it remain turbid, repeat the experiment, placing in the flask 8 mils of water and adding as before one mil of the diluted spirit. If the sample under examination contains 10 percent of camphor, a clear solution will result, at least after shaking. Make a third experiment, using 7.5 mils of water, when we shall expect that after shaking during 1 minute the solution will show no more than a faint opalescence. The three experiments may well be made simultaneously, and at the same time a fourth in which 8.5 mils of water are used. If the first three flasks show persistent turbidity, while the fourth clears up on shaking, we conclude that the original sample contains about 11 percent of camphor; if the fourth fails to clear up on shaking, the quantity of camphor is still greater. In case none of the flasks shows permanent turbidity, the quantity of camphor is below 10 percent.

All the foregoing experiments are to be made at a temperature near 20° C. (*i. e.*, between 18° and 23° C.). It is assumed that the original sample has been made with official alcohol (95%). If it has been made with a weaker spirit, a new dilution must be made which will contain approximately 81 percent of alcohol. Results of tests of this solution will be fairly exact.

Approximate determination of the percent of alcohol present in the original sample may be made by taking its specific gravity at any convenient temperature, subtracting the "correction" given below, and taking out from an alcohol table the corresponding alcohol percentage.

Sp. gr.	Correction.
0.8910	—0.0110
0.8815	—0.0115
0.8720	—0.0120
0.8625	—0.0125
0.8530	—0.0130
0.8435	—0.0135
0.8340	—0.0140
0.8245	—0.0145
0.8150	—0.0150

Example.—The specific gravity of the sample at 20° C. (15.56°/15.56°) is 0.8750. Deduct the correction, 0.0120; the remainder, 0.8630, is approximately the specific gravity at 20° C. of alcohol of the same percentage as the sample, *i. e.* (by U. S. P. tables), 80.23 — 1.31 = 78.92%. To make a dilution of 81 percent strength, mix 2 mils of this spirit (= 15.78%) with 95% alcohol, equivalent to 81.00 — 15.78 = 65.22% absolute alcohol, or 68.65%, *i. e.*, 6.865 mils, of 95% alcohol, with water q. s. to make 10 mils at 20° C.

If nothing is known of the strength, either in camphor or in alcohol, of a sample, a cut-and-try procedure may be advantageously adopted. Make the normal

test as just described. If turbidity is not produced, make a second dilution, 1 volume of the spirit to 3 of 80 percent alcohol. Failure to get a turbid solution will indicate great deficiency in camphor. According to the result of the test, make a new mixture, aiming to have present about 81 percent of alcohol. When a mixture is found to give turbidity when added to 7 mils of water, and a clear solution with 8 mils, it is clear that such mixture contains close to 2 per cent of camphor, from which the percent of camphor in the original spirit is easily deduced.

If in place of distilled water we employ in this form of the test a 5 percent solution of sodium chloride, precipitation of the camphor will be more prompt, but the precipitate which forms before the saturation point is reached is not readily redissolved. The difficulty, however, is overcome if the following routine procedure is adopted: Prepare a diluted solution as already described, containing presumably a 2 percent of camphor. Place in each of three small flasks, respectively, 11, 11.5 and 12 mils of distilled water. Add to each 1 mil of the diluted spirit, which should not cause permanent turbidity of the mixture in any of the flasks. Add now to each flask 2 mils of a clear saturated solution (about 26 percent) of sodium chloride. In case the diluted spirit contains 2 percent of camphor and about 81 percent of alcohol, the mixture in the first flask will be distinctly turbid after a minute's active shaking, that in the third will be clear, while that in the second will be cleared up almost completely by shaking.

If the sample examined contains more or less than the official percentage, the quantity can be arrived at by the cut-and-try method already described. Since the result of the test is materially influenced by variations in the quantity of alcohol present, it is perhaps best to dehydrate the spirit, if necessary, in the outset with anhydrous potassium carbonate, restoring the original volume by addition of 95 percent alcohol, then if the spirit prove to contain more than the standard quantity of camphor, reduce it by the cut-and-try method by adding 95 percent spirit before diluting, using, however, for the dilution 80 percent alcohol.

Obviously the precipitation tests are based on the assumption that alcohol of any given percentage strength will dissolve at any standard temperature always the same quantity of camphor. Thus it appears from the quantity of water required to cause incipient turbidity in spirits containing different quantities of camphor that 52 percent alcohol (volume) will dissolve more than 8 percent (weight-volume) of camphor, 50 percent spirit about 6.78 percent, 47 percent spirit less than 5 percent, 40 percent spirit only 2.14 percent. On the other hand, 10 percent alcohol dissolves only about 0.25 percent of camphor, 5 percent spirit about 0.125 percent.

It remains to consider the practicability of determining with exactness the percent of camphor in a hydro-alcoholic solution by its specific gravity. I take occasion here to retract the statement made by me in "Practical Standardization of Organic Drugs" (p. 299), that "the simplest and perhaps the best way of testing spirit of camphor is by determining its specific gravity." There are two reasons why this test is unsatisfactory; the first is that here again we have to do with two variables, each accentuating the influence of the other. The specific gravity is increased by any water which may be present as well as by the camphor we wish to determine. The second reason is that camphor in dissolving in alcohol increases its volume by more than its bulk in the solid state.

I accepted without verification the statement which I found in a book widely accepted as authoritative, *viz.*, that camphor dissolves in alcohol without change of volume; and on the strength of this statement I gave a table of the specific gravity (approximate) of solutions of camphor in official alcohol. The specific gravities given in this table are too high, and the error is the more serious from the fact that commercial alcohol in these days is apt to be above the official strength.

As a matter of fact, the specific gravity of spirit of camphor, U. S. P., is more near 0.832 than 0.8345, the 10 percent of camphor increasing the specific gravity of the alcohol by about 0.015 instead of 0.018, as would be the case if it dissolved without change of volume. Errors like this are hard to kill. This public statement should help to prevent perpetuation of the erroneous figure.

There is one way, certainly, in which we may gain information regarding the quantity of camphor in a sample of spirit, and that is by taking advantage of the fact that a saturated solution of camphor in diluted alcohol at any given temperature will have an invariable composition and therefore a constant specific gravity, while it is a simple matter to prepare from a sample of the spirit such a saturated solution by addition of water to incipient precipitation, at a fixed temperature. Here certainly is opportunity for constructing a useful empirical table.

A CRITICISM OF PART II IN THE U. S. P. IX.

BY HARRY L. THOMPSON.

In the pages devoted to Part II there is a great deal of unnecessary repetition, which increases the bulk of Part II. Pages 501 and 502 are necessary because they give an Index of the Contents of Part II.

On page 503 is the Table of Atomic Weights of the Elements. Why not add many of the important physical data often used in pharmaceutical assaying? On pages 504 to 519 are Elements and Pharmaceutical Chemicals. Why not enlarge the list to contain all chemicals known whether pharmacopoeial or not, or leave the list out entirely? The compends of physics and chemistry do a better job of it. Why not introduce logarithmic equivalents after the atomic and molecular weights or chemical equivalents? No chemist in the interest of speed and accuracy bothers with long mathematical calculations without using the short, quick processes of higher mathematics. Note the repetition of the elements and their atomic weights in heavy type.

On page 520, the Table of Multiples of Some Atomic and Molecular Weights might just as well be excluded entirely. Rarely four, five or more times of any element or radical is used in any chemical substance. I consider it a waste of printer's ink; and that it would be better to see it omitted entirely in the next U. S. P.

Why not adopt 20° C. as the standard? This conforms with the U. S. Government Bureau of Standards, and would bring about more uniformity. All accurately graduated volumetric apparatus is calibrated at 20° C. according to the U. S. Bureau of Standards. Why, then, does the U. S. P. persist in using 25° C. As a delegate to the pharmacopoeial convention I was opposed to the adoption of 25° C. Nearly every bit of graduated metric glassware used in manufacturing and

assaying is now graduated at 20° C. At least, I find it so out here in the West when it comes to purchasing any glassware of accuracy. To ask for 25° C. takes a matter of time and money. Since 20° C. is the U. S. Standard, why not adopt it?

Pages 521–554 treat of Reagents and Test Solutions. The arrangement is a good one. In some cases there are on the market reagent chemicals which are superior to those in the U. S. P.

With the exception of 25° C., the introductory paragraphs regarding Volumetric Solutions on pages 555 to 556 are very essential. *However*, why are there no methods of calibrations of balances, weights, measures and volumetric apparatus with proper corrections for temperature and pressure included in the U. S. P. under Volumetric Solutions? Such paragraphs would make clear many discrepancies and errors now existing in the processes of the U. S. P. Too much is assumed to be exactly accurate when practice shows it to be otherwise. Such errors are encountered in weights and measures and often vitiate results.

There should be a paragraph on sensibility of the balance under varying loads from the zero load to its maximum capacity. There should be a paragraph on the zero-point and its determination. A paragraph upon the testing of the balance for equality of arms should be inserted. The proper method of weighing should be given, and the proper use and care of the balance, for the U. S. P. is woefully lacking in this respect as can be seen in the statements made in many of the assay processes. There also should be a paragraph upon reducing weights to vacuo, with proper tables added thereto. No mention is made of limits of errors or tolerance in weighing and the calibration of weights; a very important factor in assaying. No mention is made of errors in reading burettes, producing a percentage of error of a measurement. Thus the accuracy acquired in practice in reading burettes is never greater than one-hundredth cubic centimeter, that is, the reading is doubtful to a tenth of a smallest division of the burette. As an error of this magnitude is possible at both of the readings, in measuring a given volume of liquid, the total error may be at least two-hundredths cubic centimeter. Careful experiments show that in careful work errors of three-hundredths cubic centimeter occur. The percentage of error of a measurement is greater, therefore, the smaller the volume of the liquid measured out, being 3 percent for 1 Cc., 0.3 percent for 10 Cc., and 0.1 percent for 30 Cc. This percentage of error is usually the controlling error, yet the U. S. P. says nothing about it. These very facts are what one often excuses as the personal factor, when really they are errors which can be accounted for in making final calculations and determining the accuracy of any assay method. Why not, then, introduce a chapter on calibration of balances, weights and volumetric apparatus, with tolerance, and percentage of error?

The statement regarding normal volumetric solutions should read 1.008 grammes of hydrogen instead of one gramme of hydrogen because the system of atomic weights has oxygen as 16 as the basis. The error in the statement as given is 0.8 percent.

The paragraph on Use of Empirical Solutions, pages 556 and 557, should be enlarged, because it is easier, quicker, and just as accurate to use empirical solutions, after the proper correction factor upon the normality used is determined.

In all laboratory work, I find that the proper conditions for keeping and using volumetric solutions cannot be kept constant. I likewise find that in the average laboratory, changes in temperature are unavoidable, and especially out here at a considerable higher altitude. By using empirical solutions and applying the properly determined correction factor at time of use saves time and gives just as accurate results, and speed with accuracy is vital.

The subject matter from pages 557 to 579 could be further condensed and much duplication avoided. Why not reduce the number of volumetric solutions? The normal and double normal volumetric solutions might as well be omitted, because the half normal volumetric solutions serve a greater number of purposes, and when once accurately standardized can be used where normal solutions are required, the proper amount of substance being assayed being taken. To make half normal volumetric solutions from normal volumetric solutions by dilution introduces too much error. Why not introduce half normal sodium hydroxide, and half normal sodium carbonate?

The list of tenth normal volumetric solutions should include tenth normal copper sulphate in place of Fehling's solution, and tenth normal barium chloride. Hundredth normal and two hundredth normal solutions might as well be omitted, and the fiftieth normal solutions kept. Then the factor of five enters in changing from $\frac{N}{2}$ to $\frac{N}{10}$ to $\frac{N}{50}$ and *vice versa*, rather than the factor of ten from $\frac{N}{1}$ to $\frac{N}{10}$ to $\frac{N}{100}$ and *vice versa*. However, the volumetric solutions of any normality should be standardized by other means than just by weighing out the solid and diluting up to a certain volume, as in the case of tenth normal potassium dichromate V. S., and tenth normal silver nitrate V. S. or with a dilution of a standard solution of different normality, as half normal hydrochloric acid from normal hydrochloric acid.

Why list the chemical equivalents of substances under each volumetric solution? Why not make a list of the chemical equivalents for half normal volumetric solutions in a table, alphabetically, and give the logarithmic equivalents after the respective equivalent? Then list under tenth normal and under fiftieth normal volumetric solutions the proper chemical equivalents. This certainly would save space, and be more convenient.

The chapter on Indications and Test Papers is very good.

Now for the General Tests. Here there is room for improvement. The chapter is a very important one to assayers and manufacturers especially. Why not enlarge it? Much of the material in Part I could still be condensed and put in Part II. Thus we have the arsenic and heavy metal tests, and assays of chlorides, bromides and iodides, etc., in Part II. Why not have the assays of the alkali and alkaline earth hydroxides, carbonates and bicarbonates, placed similarly? Why not the inorganic and organic acids; when the alkali salts are so placed? Many unsatisfactory results are obtained in assaying volatile chemical constituents. Why not use more residual titration methods which overcome this? It certainly would expedite matters. Many a time, as pharmaceutical chemist, I have radically departed from the uncertain assays of the U. S. P. and adopted the official government methods to get concordant results.

The chapters on Powders, Percolation and Sterilization should, I believe, be placed in Part I. Too few realize that they are in Part II.

If the list of Diagnostical Reagents is to be continued, why not enlarge, and increase it, and especially the clinical tests, if a pharmacist is to aid a physician? As it is, too much is dark and confusing, and the information needed must be obtained elsewhere.

The Tables of Thermometric Equivalents on pages 628 to 632 are nice to look at, but of no real value. Why not give boiling point tables, and the physical factors and corrections for altitude? Out here the boiling points of the U. S. P. are useless in determining substances, and identifying substances by distilling or melting them. One must always go to physical chemistry data and tables to know where he stands. If the U. S. P. is to serve us in the West in this respect, at an altitude from 5,000 to 7,000 feet, as it does those in the East at sea level, some vital changes must be made. If the U. S. P. is to serve the drug analyst and forensic chemist in matters pharmaceutical, changes in boiling points will be necessary for those in such high altitudes.

The tables of specific gravity of the acids and ammonia, and for the determining of the percentages of alcohol are good, and are very useful for quick assay. But what about the tables on pages 650, 651, 652 and 653? They are splendid, but too brief. To the average person too much is left to be interpreted or guessed at, and only experts know the value of them. Why not extend them to include more of similar tables, as is done in bulletins of the Bureau of Standards, so as to cover all the important apparatus used in pharmacy, with an added explanation as to their use? It certainly would be an improvement and show advancement of the scientific phase of pharmacy, which is the chief emphasis of Part II.

The Metric Equivalents and Tables for Converting Metric Quantities are good, and should be continued.

The above thoughts and questions are set forth with the idea of getting at the why of this and that in the U. S. P. Part II especially. It is time that the pharmacist be in the front line with the brother professions and not always trailing and taking their dust. Therefore the remarks are made with the idea that the U. S. P. become a scientific standard in Part II, especially along the chemical, pharmaceutical and pharmacological lines that are therein used in standardization and assaying.

UNIVERSITY OF UTAH,
SALT LAKE CITY,
UTAH.

OINTMENT OF ZINC OXIDE.*

BY A. H. CLARK.

Early in 1918 the Medical Department of the Army asked assistance from the Council on Pharmacy and Chemistry of the American Medical Association in the selection of medicaments for the use of the Army. Among these medicaments was ointment of zinc oxide and the Chemical Laboratory of the A. M. A. was called upon for suggestions in connection with this item. A number of questions were at once raised and work was started to decide upon the best practicable

---

* Read before Chicago Branch, American Pharmaceutical Association, November 1920.

formula for ointment of zinc oxide from the standpoint of therapeutic activity and keeping qualities.

So much has been published on the subject of ointment of zinc oxide that the writer has refrained from any attempt to present a review of the literature, but draws his own conclusions from his study of the published articles. Any one wishing to review the literature will find a very complete list of references and brief abstracts in the Digest of Comments on the U. S. P. and N. F. published by the Hygienic Laboratory of the United States Public Health Service. The volumes of the Proceedings and the Year Book of the American Pharmaceutical Association also contain many references to articles on the subject.

In discussing ointment of zinc oxide we may divide the subject into two distinct parts, therapeutics and keeping qualities. Subordinate to these are the subjects of physical characteristics and composition.

THERAPEUTICS.

In looking over the published work on this ointment we are made aware of some very conflicting statements as to its use as a therapeutic agent. A careful summing up of these opinions leaves one with the strong impression that ointment of zinc oxide is used solely for its local, emollient, and astringent effect, or as a protective. The most convincing evidence in this connection is a recent report by Dr. T. Sollmann to Sub-Committee 13 of the Committee of Revision of the U. S. P.[1] This report is based upon a questionnaire submitted to the members of the American Dermatological Association by its secretary, Dr. U. J. Wile. It is pointed out here that the question of absorption does not enter into the case and even if it did to determine its extent is a well-nigh hopeless task. This is in accord with the writer's experience. When this work was started it was the intention to devise some scheme for determining the absorption of the various samples made. A few experiments and an examination of the literature completely discouraged such attempts, for the present at least. For the purpose of this present paper, then, the writer considers the question of therapeutics as unimportant since any ointment will be satisfactory if it has the desired keeping qualities and physical characteristics. The formulas originally designed, because of their supposedly ready absorption, are still discussed, but from the last-mentioned standpoints only.

KEEPING QUALITIES.

As to the keeping qualities of the host of formulas proposed the published evidence is overwhelmingly against lard as a vehicle. It is quite generally conceded that an ointment made with lard, even benzoinated lard, will become rancid in time. This is as the writer found it during about fifteen years of experience with this ointment. The only way to have a U. S. P. ointment free from rancidity is to make it with perfectly fresh lard and in quantities that will be disposed of within a few weeks. Frequently the lard will be unsatisfactory to begin with, if not carefully selected. That this is not the case with ointment properly made with good petrolatum as a base, is pointed out by a number of writers and supported by the experiments recorded here.

---

[1] See *Jour. A. M. A.*, Nov. 20, 1920, p. 1420.

PHYSICAL CHARACTERISTICS.

It is generally conceded that an ointment of zinc oxide made with lard as a vehicle will granulate. This has always been the writer's experience. The petrolatum ointments do not granulate.

The best melting point is a difficult factor to determine. Temperature is such a variable quantity that no one formula will answer under all conditions.

A good zinc oxide ointment should be free from lumps of oxide or grit, *i. e.*, perfectly smooth. This can be accomplished by proper manipulation with most any of the vehicles proposed. The writer maintains that the best way to insure this (aside from mixing in a mill) is to use a glass slab and a spatula for mixing. The larger the quantity of ointment the larger the slab and spatula should be. Keep the slab warm and the task is not a difficult one even with quantities of five pounds.

Most ointments made with lard and wax will show shrinkage, *i. e.*, they will shrink away from the walls of the container. Most of those made with yellow petrolatum and with lanolin will show some separation of oily matter and some shrinkage. All this is objectionable.

To devise a single formula which gives an ointment possessing all the desirable qualities and none of the undesirable is out of the question, in the writer's opinion. All that can be done is to select a formula that comes nearest to doing this under average conditions. Should the needs of a physician be unusual, or the conditions unusual, then the physician should write a special prescription. It is very desirable, however, to have a basic formula which the physician can easily modify to meet his particular needs, that is, one which might be perfumed, made a little harder, might be diluted, etc. (The U. S. P. ointment contains twenty percent of zinc oxide which is twice the strength of most other pharmacopoeias.) To be in a position to recommend such a formula a number of ointments were prepared and have been under observation since June 1918. The absorbability was in mind when the ointments of the lanolin type were made, but since that question has been eliminated they are considered along with the others only on the basis of keeping qualities and physical characteristics.

The composition of the various ointments prepared is given below. They have been kept under conditions about the same as in a pharmacy.

OINTMENTS OF LARD TYPE.

No. 7.	Crisco	67.5 Gm.
	White wax	12.5 Gm.
	Zinc oxide	20 Gm.
No. 8.	Lard, benzoinated	70 Gm.
	White wax	10 Gm.
	Zinc oxide	20 Gm.

OINTMENTS OF PETROLATUM TYPE.

No. 1.	White petrolatum	65 Gm.
	White wax	15 Gm.
	Zinc oxide	20 Gm.
No. 4.	White petrolatum	65 Gm.
	Paraffin	15 Gm.
	Zinc oxide	20 Gm.
No. 11.	Petrolatum, yellow	65 Gm.
	Paraffin	15 Gm.
	Zinc oxide	20 Gm.
No. 12.	Petrolatum, yellow	65 Gm.
	White wax	15 Gm.
	Zinc oxide	20 Gm.

OINTMENTS OF LANOLIN TYPE.

No. 2.	Lanolin, anhydrous	65 Gm.
	Paraffin	15 Gm.
	Zinc oxide	20 Gm.
No. 3.	Lanolin, anhydrous	65 Gm.
	White wax	15 Gm.
	Zinc oxide	20 Gm.
No. 5.	Lanolin, anhydrous	45 Gm.
	Paraffin	15 Gm.
	Water	20 Gm.
	Zinc oxide	20 Gm.

OINTMENTS OF LANOLIN TYPE.

No. 6.	Lanolin, anhydrous	20 Gm.		Hydrous lanolin	10 Gm.
	Petrolatum, yellow	45 Gm.		Zinc oxide	20 Gm.
	White wax	15 Gm.	No. 10.	Hydrous lanolin	40 Gm.
	Zinc oxide	20 Gm.		Petrolatum, yellow	40 Gm.
No. 9.	Petrolatum, yellow	70 Gm.		Zinc oxide	20 Gm.

In addition to the above, a sample of strictly U. S. P. ointment was prepared at the same time as the others and is included in the discussion.

The conclusions are drawn from an examination made in November 1920, about $2^1/_2$ years after the preparation of the samples.

The results are summarized in the table below.

Lard type.	Odor.	Consistency.	Smooth.	Oily.	Shrinkage.
No. 7	objectionable	little hard	yes	no	some
No. 8	objectionable	hard	granular	no	much
U. S. P.	objectionable	soft	granular	no	none
Petrolatum type:					
No. 1	slight	good	yes	no	very little
No. 4	odorless	good	yes	no	none
No. 11	objectionable	good	yes	yes	none
No. 12	objectionable	good	yes	yes	some
Lanolin type:					
No. 2	very objectionable	good	yes	yes	much
No. 3	very objectionable	hard, gummy	yes	slight	much
No. 5	very objectionable	good	yes	no	some
No. 6	objectionable	good	yes	yes	none
No. 9	objectionable	soft	yes	yes	some
No. 10	objectionable	soft	yes	yes	none

CONCLUSIONS.

1. Lard makes an ointment that develops a disagreeable odor and one that granulates.

2. Yellow petrolatum makes an ointment that develops a disagreeable odor. The writer would be inclined to discount the evidence presented by Nos. 11 and 12 had he not seen the same thing happen in other like cases and with some samples of yellow petrolatum alone.

3. Lanolin makes an ointment with an unpleasant odor even when fresh. This becomes more disagreeable in time.

4. White wax gives an ointment that has some disagreeable odor and one that is very liable to shrink.

5. Ointments made with yellow petrolatum or containing lanolin are likely to show some separation of oily drops.

6. The ideal ointment is No. 4, made with white petrolatum and paraffin. It could easily be made harder by adding more paraffin. It could easily be diluted with petrolatum or with petrolatum and paraffin. It could easily be perfumed. It would not be readily acted upon by other medicaments which a physician might wish to add. It is odorless, does not shrink, and does not separate or granulate.

UNIVERSITY OF ILLINOIS, SCHOOL OF PHARMACY.

A QUARTER OF A CENTURY OF CHEMICAL INVESTIGATION OF A TYPICALLY AMERICAN GENUS OF PLANTS.*

BY EDWARD KREMERS.

This unwieldy title might have been greatly simplified. However, if the title is to indicate the purport of a paper, this lengthy one fulfils its purpose better than a shorter one that might reveal more of the nature of the contents. As a matter of fact, the author is relatively indifferent as to its contents, but desires to lay the stress on the research. Indeed, much, very much, work has been done that could not be reported even if several hours were to be devoted to the subject. Thus biochemically, the quinhydrone hypothesis of plant pigmentation, which has been evolved out of these investigations, might alone demand an hour or more for a satisfactory presentation. The relation between plant perfume and plant pigment, or that between both and the enzymes, or that between the inorganic constituents and the organic pigment-forming compound, might be made the subject of other papers. Pharmaceutically, one might dwell on the development of a pharmaceutico-agricultural industry, the production of American thymol; or to point to a rational explanation of the difference between red and white oils of thyme, etc. All of these phases, interesting as each and every one has proven itself, are not so much in the mind of the writer as the emphasis which he desires to lay upon research in pharmacy, continued research, even when others think it is about time to quit and to take up new fields of investigation. The inexhaustibility of any field of investigation happily does not require proof or demonstration. The common sense of exhaustive research, however, may demand explanation. After the quinhydrone hypothesis of plant pigmentation had been evolved, what more could the investigator demand? After the possibility of the production of thymol and other products had been pointed out, why not leave the practical demonstration to others? After a quarter of a century of research, why not drop the subject and take up something new? For the simple reason that after this lapse of time the horizon has grown wider than ever before, and that the subject has become more intensely interesting than ever. For justification, let me but point to the recent discovery of a new terpene, or possibly more correctly of two new terpenes; to the synthesis of new dyestuffs; and to the study of intramolecular changes of isomeric derivatives. The economic possibilities I shall only mention.

About the middle of the nineties, four men from the University of Wisconsin took the early train west and returned that evening with four sacks of horsemint on their shoulders. Since then Monarda has been gathered by the ton and distilled: *Monarda punctata* from the sandy lowlands of the Wisconsin river valley and elsewhere, *Monarda fistulosa* from the clay soil about Madison, *Monarda didyma* from the Jersey hills, *Monarda citriodora* from Texas, Monardas from Missouri, Alabama and elsewhere. Correspondence has just been entered into for a new Monarda from Arkansas. Any one who will advise us where and how other Monardas can be secured in quantity, or who will supply us with seeds so that we may raise the plants ourselves, will assist in contributing another chapter to this biochemical study of a typical genus of American plants.

* Part of an address before New York Branch, A. Ph. A., November meeting, 1920.

With the exception of a preliminary study of the inorganic constituents and some work on the oxidase, the investigations have been practically restricted to those constituents that can be isolated from the bulk of plant material by steam distillation and can, by this simple method, be concentrated as the so-called volatile oil. The equally large, or possibly larger, field of non-volatile constituents has, as pointed out, been scarcely touched upon.

ADSORPTION MEDICINES AND SIMILAR REMEDIES WITH LOCAL ACTION.

BY H. R. JENSEN, M.SC., A. I. C.

(From paper printed in *Chemist and Druggist*, July 24, p. 97. Presented before British Pharmaceutical Conference, Liverpool.)

The author described new types of remedies used during the war, especially at the hospitals connected with the Liverpool Tropical School. At the outbreak of the war the best treatment known for the destruction of the amoebic parasite frequenting the large intestine, more particularly in the sub-acute form of dysentery, was the hypodermic injection of emetine. On the assumption that the prolonged—as distinct from the delayed—action of the emetine was the most important factor in dosage, Dr. H. H. Dale, F. R. S., introduced the use of emetine bismuth iodide, devised by Du Mez. This compound should be practically insoluble in the acid stomach, but in the alkaline small intestine free emetine is gradually liberated, and passes through for local action on the parasites in the large intestine, where it is dissolved by the fermentation acids. This is a mechanism analogous to that of salol. Du Mez' analysis of his compound, prepared by the addition of Dragendorff's reagent to a 1 in 300 solution of emetine indicated a composition (emetine), $(5HI)BiI_3$, with a content of 29 percent of emetine.

Concurrently with this use of emetine, Allan in America, and Professor Stephens at the Liverpool School of Tropical Medicine, made an extensive clinical study of the numerous cases of sub-acute dysentery, using a proprietary adsorption compound of "total alkaloids" of ipecacuanha in physico-chemical union with a hydrous aluminium silicate derived from a clay or fuller's earth, as devised by J. U. Lloyd. Chemically this compound reacts in the same way as the double iodide, being insoluble in acid solutions, and liberating alkaloids with alkalis. In 1917, in ignorance of the extensive American master patents in such remedies, the author prepared a new series of drugs, for which purpose, as they were not otherwise obtainable, a temporary license was issued to cover use in the Government hospitals.

PREPARATION.

The simplest method is by suspension of a suitable fuller's earth in a solution of the alkaloid salt or galenical extract. On shaking combination occurs at once, when the product is filtered off, washed and dried with special precautions. Adsorption is in general greater in aqueous than alcoholic solution, and in strong than weak concentration. In practice special technique is required to obtain a product of the great lability desired, with which decomposition will not be too slow. The earth should be selected with the highest degree of hydration, and usually with high iron and calcium content. The high initial adsorptive value required, which cannot be gauged by its well-known bleaching power, but may be related to the detergent quality, must be raised by a series of lixiviations to the greatest extent. In addition the concentration in which the drug is primarily dispensed in the adsorbent, as well as the degree and nature of after-dilution, are factors.

In addition to the points set forth in the printed abstract, the author also emphasized the possibilities of partial recombination before the separate portions of the adsorptions had finally left the body. He suggested that it would be interesting to observe to what extent alkaloids oxidized or reduced while adsorbed, and that it must be determined what the adsorbing ratios were with alkaloid solutions of gradually decreasing concentrations, as must the exact quantitative reactions of a saturated adsorption to solutions of other alkaloids.

Department of Commercial Interests

CONDUCTED BY DR. ROBERT P. FISCHELIS.

Richard Spillane, the editor of the Business Section of the *Philadelphia Public Ledger*, touched a vital spot in discussing the drug business a few weeks ago before the students and alumni of the Philadelphia College of Pharmacy. He said: "The trouble with you druggists is that you do not seem to want me to come into your stores and make myself at home, and, furthermore, you don't trust me. When I go to your soda fountain you make me buy a check before I get my drink. That makes me feel you do not trust me to pay for what I am getting."

There is much truth in the remarks recorded above. The business man cannot always see things from the same viewpoint as his customers. Hence, what may be a good system as far as the financial management of the store is concerned may be a very poor system for holding customers, and it is not difficult to decide what should be done under the circumstances. We have all read that large chains of stores, hotels and other business ventures proceed on the theory that the customer is always right, and instruct their representatives, clerks and others to do business on that basis. Of course, there is a rational middle ground which the independent conservative retailer must follow to win success. It is not necessary to let a customer make a servant of you or your clerks, nor should the store-keeper be expected to lose money to gratify a customer's whim, or break long-established methods of doing business that have withstood the test of time in order to favor one out of a hundred customers. It is well to ignore many unreasonable demands made by customers, but it is one thing to refuse to do things in a gruff and offensive manner and another thing to explain in courteous tones why it is impossible to comply with the unreasonable request. In the first instance the customer will leave with a vow never to return to the store again for anything, whereas in the second instance he will feel as though he should apologize for having wanted to impose on the druggist.

The pharmacist, more than any other retailer, is somewhat of a public servant, and he should be accommodating, especially where sickness is involved, yet withal he should maintain that quiet dignity and poise which becomes a professional man. There are two ways of doing everything—one is the wrong way and the other is the correct way. No human being can select the correct way one hundred percent of the time, but one can train oneself to automatically do the correct thing nearly one hundred percent of the time. This is the true measure of success. The man who continually explains what he might have done or should have done under certain circumstances belongs to a type which cannot depend on snap judgment. He should always spar for time when he is confronted with a new or unusual situation. I know the head of a large pharmaceutical house whose snap judgment is the best judgment ninety-five times out of a hundred. When he turns things over in his mind and deliberates long upon a problem he invariably does the wrong thing. The quicker he disposes of a problem the better is his judgment. It is a case of "Know thyself" with every man. Those of us who are

impulsive and do things on the spur of the moment know it, and we should guard ourselves against the dangers of this disposition in dealings with our fellow-men; on the other hand, those who deliberate long before coming to a decision should take care lest they may be hours or days too late to enjoy the success that would have followed their decision had they made it in time. Sizing up one's own limitations requires great moral courage, but a good business man will have this courage and will call upon his associates or employees to do the things which he knows he can not do well himself. The greatest organizers who get results are those who can marshall the brain and brawn of their fellow men and get them to accomplish what they know they can not accomplish themselves.

So it is in the apothecary shop. It is no sin for the proprietor to be less skillful than his clerks in certain branches of the business, but it is nothing short of a sin for him to continue to do things in a mediocre way which he can afford to have others do for him to much better advantage. If the proprietor is not a good mixer, and has pronounced likes and dislikes, he should endeavor to meet, in the store, only those people with whom he can make a favorable impression, and send one of his clerks out to the counter to meet those with whom he has nothing in common and whom he is likely to offend by an indifferent manner. That is good business judgment and tends to hold trade.

If the conditions in the soda fountain department make it necessary to require buying checks of a cashier before serving, this requirement should be enforced as graciously and inoffensively as possible. It is very annoying to the customer to be told to buy checks when he is treating some friends, because he must find out what each person wants and then tell the cashier so as to get the right amount in checks to hand to the dispenser. If one person changes his mind before a drink or sundae is served it means trotting back to the cashier's desk to have the checks adjusted. How much simpler for the customer to order and then be told how much he must pay or to be handed a check for the amount due and pay the cashier as he leaves. The easier you make it for the customer to spend his money the better he likes it. Don't forget his viewpoint when you evolve your system.

LABORATORY NOTES.*

By George E. Ewe.[1]

THE GERMICIDAL POWER OF OXALIC ACID.[2]

The National Standard Dispensatory, on page 71, states that oxalic acid "is a good antiseptic and is used by many surgeons to disinfect the hands."

While the fact that oxalic acid does possess considerable germicidal power is quite generally known, yet its relative power in comparison with phenol, which is the generally accepted standard

---

* Scientific Section, A. Ph. A., City of Washington meeting, 1920.

[1] Unless otherwise stated the reports are by the author.

[2] Credit is due Mr. R. J. Monson, of the Biological Laboratories of the H. K. Mulford Company, Glenolden, Pa., for making the phenol coefficient tests mentioned in this communication.

upon which the statement of germicidal power is based, is probably not so very well known. Therefore, these notes are to be considered as a contribution to this subject.

Determinations of phenol coefficient by the Hygienic Laboratory Method were made on crystallized oxalic acid from six sources with the following results:

Source.	Phenol coefficient.
1	10.83
2	10.27
3	11.66
4	10.27
5	9.85
6	10.69

Therefore, the average phenol coefficient of crystallized oxalic acid is 10.6 and can be stated in round numbers as "10 to 11."

Oxalic acid, when dried, increases in phenol coefficient in practically direct ratio to the concentration effected by the loss of water of crystallization. The crystallized oxalic acid from source No. 1 when rendered anhydrous possessed a phenol coefficient of 14.4, the theoretical being 15.3.

The "Pharmaceutical Codex" 1911 also reports the phenol coefficient of oxalic acid essentially as 10 in the following words:

"A 0.5% solution is equal to a 5% solution of phenol as a bactericide and disinfectant."

Oxalic acid, therefore, is a very effective germicide, but its general use is not to be encouraged because of its decidedly toxic nature. It seems likely, however, that its germicidal power may find some special uses in the hands of persons properly informed of its virtues and shortcomings. If sold for general disinfecting purposes, it is desirable that its appearance be strikingly altered so as to call attention to its poisonous nature. Probably the best way to do this is to color the crystals with a dye. This can be readily done by spraying or sprinkling the crystals with an aqueous solution of a dye, mixing well and then allowing the dyed crystals to dry in the air. A blue color is very appropriate and "Soluble Blue B" is a very satisfactory blue color for this purpose.

Because of the poisonous nature of oxalic acid, it is inadvisable to use it on the person or on animals of any kind. Therefore, its use seems limited to the disinfecting of waste matters and localities from which there is no possibility of its finding its way into the economy of persons or animals.

The acidic nature of oxalic acid suggested the possibility that corrosion might result from its use on metallic articles, and it was supposed that by neutralizing it, or, in other words, using a neutralized oxalic acid, similar germicidal effect might be obtained without the accompanying corrosive action. But actual determinations on sodium oxalate, from two different sources, showed that these salts of oxalic acid possessed no germicidal power.

NOTES ON DENIGÈ'S TEST FOR CITRIC ACID.

Denigè's test is very useful for the detection of citric acid for the reason that tartaric acid, which is the acid most commonly associated with citric acid in mixtures, does not react with this test.

The test is applied as follows: The sample is dissolved in water and acidified with dilute sulphuric acid if it is not already acid. It is then filtered if necessary and a strong solution of mercuric sulphate in diluted sulphuric acid is added. The mixture is heated to boiling and a saturated solution of potassium permanganate is added drop by drop.

If citric acid is present, the pink color of the potassium permanganate is discharged and copious white precipitate is formed. Many substances other than citric acid will discharge the pink color of the permanganate, but only citric acid gives the copious white precipitate.

The test was applied to commonly met-with mixtures with perfect success:

Sample.	Result.	
Tartaric acid	Decolorized	No precipitate
Citric acid	Decolorized	Copious white precipitate
Tartaric acid, 80 parts Citric acid, 20 parts	Decolorized	Copious white precipitate
Tartaric acid, 80 parts Sugar, 20 parts	Decolorized	No precipitate
Tartaric acid, 80 parts Sodium bicarbonate, 20 parts	Decolorized	No precipitate
Tartaric acid, 60 parts Sodium bicarbonate, 20 parts Citric acid, 20 parts	Decolorized	Copious white precipitate
Tartaric acid 50 parts Citric acid, 20 parts Sodium phosphate, 50 parts	Decolorized	No. precipitate
Tartaric acid, 30 parts Sodium phosphate, 50 parts	Decolorized	Copious white precipitate
Tartaric acid, 40 parts Sodium phosphate, 40 parts Sodium bicarbonate, 20 parts	Decolorized	No precipitate
Tartaric acid, 20 parts Citric acid, 20 parts Sodium phosphate, 40 parts Sodium bicarbonate, 20 parts	Decolorized	Copious white precipitate

COCAINE HYDROCHLORIDE—A (NEW?) QUALITATIVE TEST.

Upon igniting Cocaine Hydrochloride a characteristic odor is given off. The odor resembles that given by atropine or one of its salts when heated with sulphuric acid as directed by the U. S. P. VIII for the identification of atropine. The odor was described by the U. S. P. VIII as recalling the odor of a mixture of rose, orange flower and melilot.

No record of a previous report of this test can be found by the writer.

NOTES ON THE ESTIMATION OF REDUCING SUGARS BY THE BENEDICT METHOD.

RATE OF OBTAINING END-REACTION.

In the description of the method and the manner of conducting sugar estimations, as outlined in the *Journal of Biological Chemistry*, Volume 9, pp. 57 to 59, by Benedict, particular emphasis is laid upon the necessity of exercising care in adding the sample to the boiling test because of the tardiness of the end reaction.

Quoting Benedict: "Measure 25 Cc. of the reagent into a porcelain evaporation dish (25–30 cm. in diam.) and add 10–20 Gm. of crystal Sodium Carbonate (or $^1/_2$ the weight of the anhydrous salt) and a very small quantity of powdered pumice stone. Heat the mixture to vigorous boiling over a free flame and run in the sugar solution quite rapidly until a heavy white precipitate is produced, and the blue color of the solution begins to diminish perceptibly. *From this point the sugar solution is run in more and more slowly with constant vigorous boiling, until the disappearance of the last trace of blue color, which marks the end-point* * * * * In this method, as in any other where the disappearance of color is made the end-point, there is a tendency to run in an excess of the reacting substance unless *special care* is exercised throughout the titration and particularly at the end. The solution must be kept vigorously boiling over a free flame during the entire process, and towards the end the sugar solution must be added in portions of a drop or two, *with an interval of about 30 seconds after each addition.* Should the mixture become too concentrated during the titration process, distilled water may be added to replace the volume lost by evaporation."

The use of care in slowing down the addition of the sugar solution when obtaining the end-reaction was also emphasized by J. L. Mayer in an article entitled "Quantitative Estimation of Glucose in Urine" (JOURN. A. PH. A., July 1919, p. 551) in the following words: "Add the sugar solution * * * with *sufficient slowness* to allow the reaction to proceed, putting the flask back on the hot plate until disappearance of color."

No other references were available to indicate the rate at which this method could be quantitatively carried out, so this was determined as follows:

Standard Material: Merck's Reagent Dextrose dried at 75° C. to constant weight; the anhydrous dextrose then being made into exactly 1% solution with distilled water, weighing the dextrose on an analytical balance.

Procedure of Test: The 1% solution was placed in a burette and the test conducted as directed by Benedict, with the exception that after the test was brought to boiling, the sugar solution was added 1 Cc. at a time until a heavy white precipitate was produced and then reduced to one or two drop portions until the last trace of blue color disappeared and the time over which the sugar solution was added was varied. The results of these tests were as follows:

Time allowed to obtain end-reaction.	Assay of the 1% dextrose solution.
1 1/2 minutes	0.724%
2 minutes	0.961%
3 1/2 minutes	1.00%
4 minutes	1.00%
4 1/2 minutes	1.00%
5 minutes	1.00%

Therefore, it is evident that at least 3 1/2 minutes must be allowed for obtaining the end-point when the sugar solution averages around 1 percent. In using this 3 1/2-minute period with the Benedict method, it is necessary to dilute sugar solutions of higher sugar content than 1 percent down to approximately 1 percent. At least 3 minutes must be allowed in obtaining the end-reaction with solutions containing less than 1 percent of sugar.

ACCURACY OF THE BENEDICT METHOD.

In the description of the method by Benedict in the *Journal of Biological Chemistry*, mentioned above, no figures are given regarding the accuracy of the method, but the following statement is made:

"As regards the accuracy of the process, it may be noted that repeated determinations by different workers during the past year have convinced the writer that the method is probably more satisfactory than any other titration method for sugars at present available. Check determinations with the gravimetric (Allihn's) and polariscope processes have shown that the method gives highly satisfactory results, the figures in the various applications of it differing even less than those reported for the writer's previous quantitative sugar process."

Experiments to ascertain the accuracy of the method were carried out as follows:

Standard Material: Merck's Reagent Dextrose was dried at 75° C. to constant weight and solutions of 2 percent, 1 percent, 0.5 percent and 0.25 percent strength were prepared by weighing out the proper quantities on an analytical balance. The assay of these standard solutions was carried out as directed by Benedict with the exception that at least 3 1/2 minutes were allowed for obtaining the end-reaction, and in the case of the 2 percent solution 50 Cc. of the reagent and 30 Gm. of crystal sodium carbonate were used. The results were as follows:

Strength of standard solution.	% found upon assay.	
2%	1st assay, 2.00%	
	2nd assay, 2.00%	
1%	1st assay, 1.00%	
	2nd assay, 1.00%	
0.5%	1st assay, 0.500%	av. 0.498%
	2nd assay, 0.495%	
0.25%	1st assay, 0.253%	av. 0.249%
	2nd assay, 0.245%	

APPLICATION OF THE METHOD TO SUCROSE-DEXTROSE MIXTURES.

Standard Materials: Sucrose—market quality of table cane sugar assaying 0.03% invert sugar by the method outlined on page 43 of *Bulletin* 107, Bureau of Chemistry, U. S. Dept. of Agriculture.

Dextrose: Merck's Reagent Dextrose dried at 75° C. to constant weight.

Mixtures of these were made by weighing out the proper proportions on an analytical balance to obtain dextrose contents of 2 percent, 1 percent, 0.5 percent and 0.25 percent, and these mixtures were dissolved in water to obtain solutions 100 Cc. of which contained 50 Gm. of the mixtures. The assays were carried out as directed by Benedict except that at least $3^1/_2$ minutes were allowed for obtaining the end-reaction. The following results were obtained:

Dextrose content of sucrose-dextrose mixture.	% of dextrose found.	
2%	1st assay, 2.00%	
	2nd assay, 2.00%	
1%	1st assay, 1.040%	av. 1.043%
	2nd assay, 1.046%	
0.5%	1st assay, 0.540%	av. 0.542%
	2nd assay, 0.544%	
0.25%	1st assay, 0.240%	
	2nd assay, 0.240%	

Leaving out of consideration the negligible effect of the invert sugar content of the sucrose, the results may be called satisfactory and the method appears to be applicable to the estimation of invert sugar in sucrose.

It is interesting to record here for comparison the results yielded in my hands, on the standard sucrose-dextrose mixtures, used in the application of the Benedict method to sucrose-dextrose mixtures, by the method outlined on page 43 of *Bulletin* 107, Bureau of Chemistry, U. S. Dept. of Agriculture, for the estimation of invert sugar in materials containing 1 percent or less of invert sugar and 99 percent or more of sucrose.

Dextrose content of sucrose-dextrose mixture.	% of dextrose found.
2%	1.83%
1%	1.04%
0.5%	0.46%
0.25%	0.21%

FORMULA FOR BENEDICT'S REAGENT FOR THE ESTIMATION OF REDUCING SUGARS.

For the benefit of those to whom Volume 9 of the *Journal of Biological Chemistry* is not readily available, the formula for the reagent is appended here:

Copper sulphate (cryst.)	18.0 Gm.
Sodium carbonate (cryst.)	200.0 Gm.
Sodium citrate	200.0 Gm.
Potassium sulphocyanate	125.0 Gm.
5% Potassium ferrocyanide solution	5 Cc.
Distilled water, q. s.	1000 Cc.

With the aid of heat dissolve the citrate, carbonate and sulphocyanate in enough water to make about 800 Cc. of the mixture and filter. Dissolve the copper sulphate separately in about 100 Cc. of water and pour the solutions slowly into the other liquid, with constant stirring. Add the ferrocyanide solution, cool, and dilute to exactly 100 cc. Of the various constituents only the copper salt need be weighed with exactness. Twenty-five Cc. of the reagent are reduced by 0.050 Gm. of dextrose or 0.053 Gm. of levulose.

LYE AS A DISINFECTANT.

A commercial preparation consisting of an odorless, white, granular powder with an intensely caustic taste has been advanced as a "disinfectant."

Upon analysis the following composition was revealed:

Caustic soda (NaOH)	94%
Washing soda (Na_2CO_3)	2%
Common salt (NaCl)	2%
Undetermined (water, sodium sulphate, insoluble matter, etc., by difference)	2%
Total	100%

The phenol coefficient was 12.7.

Therefore the preparation consisted of a commercial lye and while it possessed strong disinfectant properties, its usefulness as a disinfectant is limited to such conditions and materials as will withstand the use of strong caustic alkali.

A NOTE ON THE SAMPLING AND DISPENSING OF PHENOL U. S. P.

The U. S. P. requires phenol to contain not less than 97 percent of absolute phenol and to have a congealing point of not below 38° C.

U. S. P. phenol frequently comes into the market in glass or tinned iron containers, in a solidified condition to the greater extent, but with a small proportion of it liquefied, the liquefied portion rising to the top of the container.

The congealing points of samples of this liquefied portion from 2 different shipments of phenol, were 25° C. and 24° C., respectively, and therefore very much below the standard of U. S. P. phenol in strength. Upon completely liquefying all of the phenol and mixing well to include all of the liquid layer in the bulk of the phenol, the mixtures had congealing points of 39° C. and 40° C., respectively, and therefore readily passed the U. S. P. congealing point requirements.

The chemical character of the liquefied layer was not determined but probably consisted of phenol deliquesced by absorption of moisture due to the likely convenient practice of packing phenol in a warm liquefied condition and permitting the container to remain unstoppered or poorly stoppered until the phenol attains room temperature.

This liquefied portion of phenol should not be sampled or dispensed, but should be removed, the congealing point of the bulk of the phenol determined, and the liquefied portion then incorporated with the bulk of the phenol, provided it is not of sufficient amount to decrease the congealing point of the whole mixture below 38° C.

"LECHE DE HIGUERON."

This consists of a thick, creamy liquid used in Central America for the treatment of hookworm. It is the sap from the "Higueron" plant, as it is known locally. The "Higueron" plant is also known locally as a species of "rubber plant."

"Leche de Higueron" is a white, creamy liquid, resembling the cream of the cow, but more viscous in consistency. When fresh, it has a very faint, pleasant odor. Proximate analysis:

Fatty matter (fixed)	7.00%
Proteid	5.50%
Ash	0.50%
Moisture	78.72%
Undetermined	8.28%
Total	100.00%

Qualitative analysis of the ash showed CaO, MgO, Al_2O_3, Fe_2O_3, K_2O, Cl and SO_3.

The exact nature of the matter designated "undetermined" in the above analysis is in doubt, but it consists in part of a sulphur-bearing organic constituent.

No alkaloids, starch, sugars, glucosides or tannins could be found.

"Leche de Higueron" when fresh, possesses a very faint, pleasant odor, but soon decomposes and develops a very objectionable, putrid, sulphidic odor. It can readily be preserved by the addition of about 12 percent of alcohol. A one-gallon lot, so preserved, kept perfectly sweet in odor for three years. This preserved lot yielded the following analysis:

Color: Creamy white.

Consistency: Thinner than plain product.

Odor: Alcoholic.

Specific gravity: 1.019 at 25° C.

Absolute alcohol by volume: 11.1 percent.

Proximate analysis (calculated to alcohol-free basis):

Fatty matter (fixed)	11.19%
Proteid	11.21%
Ash	0.53%
Moisture	74.41%
Undetermined	2.66%
Total	100.00%

The "undetermined" matter contained organically combined sulphur. No alkaloids, starch, sugars, glucosides or tannins were present.

The ash contained the same constituents as the fresh sample.

As is to be expected, with a natural product, these two lots show considerable variation upon analysis.

No definite constituent likely to account for the vaunted efficacy of "Leche de Higueron" in the treatment of hook-worm disease could be demonstrated.

"BUTA."

"Buta" is a woody drug used with some repute in Peru, S. A., as a "blood tonic" and "in the delivery of children."

Alkaloidal extraction procedure yielded a small amount of residue which gave reactions for alkaloids with both iodine test solution and Mayer's reagent.

One-Cc. doses of a tincture prepared for injection and injected intravenously into dogs, by the proper procedure, produced an immediate and considerable rise in blood pressure, which, however, returned to normal in about five minutes. Injections of 2 Cc., intravenously, produced a much more sustained rise in blood pressure.

This blood-pressure raising effect probably accounts for the stimulating and "tonic" effect noted by users of the drug.—Reported by George E. Ewe and P. S. Pittenger.

"GOLENDRINA."

A plant drug, so called locally, is employed in Texas in the treatment of dysentery.

"Golendrina" is a stemmy plant averaging about 2 ft. in height and with small leaves.

Botanical classification: Family: Rubiaceae.

Genus: Opercularia.

Variety: Could not be determined.

Chemical examination: Contains large proportion of tannins, some gum and a little waxy matter.

No alkaloids or glucosides were present. Starches, sugars and resins were practically absent.

Physiological tests: 1-Cc. doses of a half-strength fluidextract of the drug when injected intravenously into dogs produced no apparent effect on the blood pressure. When the dose was increased to 6 Cc., however, a primary fall of 16 millimeters was produced, possibly due to the shock of injection, after which the pressure quickly returned to normal and then steadily increased until a few minutes after injection the pressure was 30 mm. above normal. This increased pressure returned gradually to normal in about one-half hour.

Possible therapeutic action: The presence of considerable tannin logically accounts for the successful use of this plant in the treatment of dysentery. The plant also appears to possess a stimulating and tonic effect on the circulatory system which is valuable in correcting the prostration accompanying dysentery.

NOTE ON A COMMERCIAL LECITHIN.

A sample of lecithin reputed to be derived from eggs and having a market price of $2.10 per ounce, assayed 91.6 percent of lecithin, calculated as $C_{42}H_{84}NPO_9$. The method of assay was the total P_2O_5 method of fusing with mixed carbonates, aiding combustion with potassium nitrate.

It is needless to say that *fresh* eggs could hardly have been the source of this product, since lecithin occurs principally in the yolk; one yolk contains only one drachm of solid matter, on the average; the maximum reported yield of lecithin from egg yolk is about 10 percent, and

therefore 80 eggs would be required to produce one ounce of this lecithin. This is not said in disparagement of this product, as it is often entirely possible to extract "pure chemical substances" from putrid matters.

"PLANT LOTION" FROM PORTO RICO.

In Humacao, Porto Rico, a "Plant Lotion" finds some considerable use. It is prepared from a local plant and is used for sprains and bruises.

Description: A brownish, muddy liquid, containing a dirty white sediment equivalent to about 5 percent of its volume. The liquid has an aromatic tincture-like odor.

The sediment: Is insoluble in cold water and consists practically entirely of a starch (shaped similar to corn starch under the microscope); the balance of the sediment being a very small amount of a dark brown, flocculent, non-resinous substance.

The liquid portion: Is slightly acid to litmus; reduces Fehling's solution directly and contains alcohol. Is free from tannin or other bodies which yield colors with ferric chloride (such as salicylic compounds). When distilled, a colorless, slightly acid distillate, having the odor of fresh popped corn, is obtained. The residue in the flask is a soft, light brown, sweet mass which chars on heating, giving aromatic and caramel odors free from acrolein odor or the odor of burning proteid matters. When the liquid portion is extracted with a mixture of ether and chloroform, a very slight amount of fatty matters, free from resin, is obtained. When rendered alkaline with ammonia and extracted with a mixture of ether and chloroform, a very slight, greasy residue is obtained which is free from alkaloids.

The ash of the extracted matter: Is very small in quantity, white, insoluble in water, soluble in dilute acids with effervescence and contains CaO, Fe_2O_3, Al_2O_3 and CO_2.

Efforts to obtain some of the plant used in the manufacture of "Plant Lotion" met with no response.

Evidently "Plant Lotion" is a dilute alcoholic extraction of an undetermined plant, made by cold maceration and expression. The plant is very likely similar to Zea Mays of the Gramineae family or some other saccharine plant, although a slight admixture of some aromatic plant is probable.

No definite constituent could be demonstrated warranting the claim of value for use on sprains and bruises, except traces of aromatic constituents and the alcohol.

SOURCES OF POTASH.

A lot of molasses ash assayed 27.4 percent of metallic potassium.

A lot of tobacco stems assayed 3.13 percent metallic potassium and a lot of dried apple peelings assayed 0.828 percent metallic potassium, 0.13 percent total phosphorus and 0.91 percent total nitrogen.

PHARMACEUTICAL LABORATORIES,
H. K. MULFORD COMPANY,
PHILADELPHIA, PA.

DRUG TRADE STATISTICS.

Drug Topics prints the following information, compiled by Saunders Norvell:

Number of retail drug stores in the United States, 49,000.

There is one retail drug store to every 2,048 of the population.

Forty-four and one-half percent of these stores are rated at $2,000 or less.

Of these 44½ percent, 92 percent are without rating in the commercial agencies. Twenty-three and one-half percent are rated at $2,000 to $5,000.

Of these 23½ percent, 67 percent are without rating in the commercial agencies. Seventeen percent are rated over $5,000 and less than $10,000. Eight percent are rated at $20,000 and over.

Thirty years ago the number of drug items on the market was 2,699.

The number of drug items now on the market is 45,900.

The patent medicine business of the average wholesale druggist is 54 percent of the total sales.

Of this 54 percent, only 12 percent are distributed in lots of one dozen or more.

HOUSE OF DELEGATES, AMERICAN PHARMACEUTICAL ASSOCIATION.

ABSTRACT OF THE MINUTES OF THE SESSIONS HELD IN THE CITY OF WASHINGTON, MAY 7 AND 10, 1920.

First Session.

Chairman Samuel L. Hilton called the meeting to order. Upon motion the roll-call was dispensed with.

The Chairman introduced Major A. P. Clarke, representing Surgeon General Ireland of the U. S. Army, who spoke in part as follows:

"Surgeon General Ireland, of the United States Army, has asked me to extend to you his personal greetings and the greetings of the Medical Department of the Army, and I assure you that it gives me great pleasure to do this.

"General Ireland feels that you are particularly interested in the status of pharmacists in the United States Army, both in the active Army during peace and in the reserve force which is held in preparation for any future war. As you know, that status is more or less dependent upon subsequent legislation. There are before Congress several bills at the present time and I will refer to these in my remarks.

"We have had during the war an administrative corps in the Medical Department, the Sanitary Corps. The bills that are now before Congress change that name to the Medical Service Corps. These bills authorize a reserve section for every branch of service that appears as a part of the active Army. There would be, therefore, a reserve section for the Medical Service Corps, and as a branch thereof a section devoted to pharmacy. In the present Army the Medical Department, during peace, has relatively few units as compared with the number of units during war. When I speak of a unit I mean a hospital. The reasons, of course, are quite apparent. The great function of the Medical Department—whether in times of peace or war—is that of salvaging the human material that has become injured. Our efforts are always directed towards returning to the firing line the maximum possible of injured men in sufficiently fit shape to fight or to at least carry on.

"In war we have, as you know, a tremendously greater expectancy in sick and wounded for various reasons. The result is that, even at the very start, we must naturally have a greater number of units receiving the sick and wounded. We must have a sufficient number of units to receive the sick and wounded from the firing lines when it becomes necessary to evacuate certain positions and this, a great task, must be done in an orderly manner. In order to do that it requires an additional overhead in these hospital organizations.

"In times of peace we need in our hospital well-trained pharmacists. And when I speak of a pharmacist, I speak in the sense that we know the pharmacist in civil life. The need, therefore, is quite apparent and urgent, and in war it is also apparent, but more urgent. The need in war, naturally, can never be met by the number of active pharmacists on duty during times of peace. Just as every branch of the service looks to the civil body to supply its needs, so the Medical Department of the Army goes to the civil body to supply that need for us. We have now in civil life approximately 4,000 pharmacists who served with the army during the war. In recognition of the need of the Medical Service Corps, we hope Congress will permit us to organize our pharmaceutical section with men who have devoted their time to the study of pharmacy in civil life.

"We have now a project before the General Staff that calls for an increase in the scope of the educational system for the Medical Department. The primary object of the educational system is to prepare our young men entering the Service. An object that is possibly secondary, although almost primary, is that of helping to insure the country against war as far as the Medical Department can do so. The project calls for a field school. Tentative arrangements have been made, and we have asked the War Department for a site which we contemplate will be located at the old Indian School, at Carlisle, Pa. Here we expect to expend the facilities and be prepared to receive men from civil life and give them a short course in intensive training.

"If, therefore, we have a section of pharmacists and Congress authorizes this system, the men who qualify will be given the rank of from Second Lieutenant to Major. If the bills are

passed we will then have a large number of pharmacists who may be commissioned as officers of the Pharmaceutical Section of the Reserve Corps. The commissioning of a pharmacist will be dependent upon his age and professional attainments in civil life and, as stated, the rank to be given an individual will range from Second Lieutenant to Major, according to his qualifications.

"A certain number of these men will have had prior service, others will have had no military training. It will be necessary, therefore, to coördinate their professional attainments and their technical ability with the needs in the Service as officers or as soldiers. It will then be the desire of the Medical Department of the Army to have a certain number of those men ordered to our school upon active duty, where we will give them a six weeks' to two months' course in military training. In a way we will administer education in tabloid form.

"In order to do this it will be necessary for the office of the Surgeon General of the Army to have accurate statistical records—that is, live records—of the available assets, in personnel, in civil life.

"We are prone to think of the pharmacist as the man behind the counter in a drug store, but that is only one phase. There are men in pharmacy who have broad business experience, business ability in buying, and in a very material way possess qualities which make them highly desirable for service in the Army. These men, naturally, fit into the military machine in time of war.

"In time of peace the requirements of the Army are naturally somewhat narrower in scope. We are expecting Congress to authorize the Medical Service Corps to consist of a force of commissioned officers and, possibly, at the same time a force of enlisted men. These men from the rank of private up to the grade of Major will be concerned with administrative work, but in order to be successful in the Army, they must have passed through the lower grades. It is anticipated that the enlistment period will be approximately three years, and in order that a man may obtain the commission for which he aims, it is expected that he will serve a certain length of time as a non-commissioned officer. From the grade of non-commissioned officer, it is expected that the soldier, if properly qualified, will be able to pass an examination and be in line for promotion to the first commissioned grade, that of Second Lieutenant.

"The present status with regard to the requirements for admission into a civil pharmaceutical school is that the applicant must have had two years of high school training. I believe ultimately it will be required to have a certain amount of college work before he may take up the study of pharmacy.

"The plan of the Medical Department considers that a man should graduate at a school of pharmacy at about the age of 21, and at that time enter the Army and receive his preliminary training as an enlisted man, and at the end of a short period, if qualified, be appointed to a commissioned rank and still continue the practice of pharmacy, going forward gradually to the grade of Major.

"We have in addition to the field school project an additional phase of the educational program. This is a strictly technical school, the Army Medical School. This school is located in Washington. It is now occupying quarters in an office building where it has been located for a number of years, but it is about to be moved, as soon as an appropriation is made available, to the large medical center at the Walter Reed Hospital.

"I would like to be able to give you an approximation of the number of pharmacists the Army might need, but it is almost impossible to foretell that need for any future war. For the present, at least not until the present bill is passed and becomes law, it is impossible to say just how many pharmacists we must have on our active list. The number to be placed on the inactive list will depend upon the War Plans Division of the General Staff which will indicate to us exactly what the Army program is to be.

"But in this connection the point is that some agency must possess the data that I have spoken of, in order that we may be able to say exactly what we are to expect from the men in civil life, from which source we are to draw our pharmacists for the Reserve.

"It has been brought to my attention to-day that efforts are being made in your Association to tabulate and coördinate such data in which there will be an attempt to line up the schools from which we are to obtain pharmacists. This will not be done from the standpoint of preparing

for a war, but from that of insuring against war, and to preserve the records of those of the profession of pharmacy who fought for our country.

"One desire of the Medical Department is to know how many civilian pharmacists are available, and then also: their qualifications, that they meet the standards of the profession; their ages; from what school they have graduated; their respective standing in the communities where they reside. Such information would be highly and extremely useful to the Surgeon General of the Army. Once it is received it will be compiled and made a matter of permanent record in the office of the Surgeon General, for reference when required.

"I want to impress upon you the fact that Surgeon General Ireland feels that there is a place for the pharmacist in the United States Army, and that he is vitally interested in their welfare, whether on the active list or in the reserve, and that he thinks the pharmacist has a very definite function in military life and action."

Lieutenant Paul F. Dickens, representing Surgeon General Braisted, of the U. S. Navy, was then introduced by Chairman Hilton. The subject of his address was,

THE PHARMACIST IN THE NAVY.

The almost universal misconceptions which have so long prevailed in regard to military matters in general include also the duties and career of the naval pharmacist. I know that a goodly proportion of those who listen to me to-day have had their ideas of the duties and specific functions of naval pharmacists changed by having been closely associated with them in the late war, and undoubtedly many of you are now, in some degree, familiar with military life.

In the very nature of things, every individual member of our naval organization has a position all his own. You each have yours. It belongs to you by reason of your fitness to perform certain specific tasks more efficiently than others who lack your training and experience. This is true also in naval life, where all positions are very sharply defined. * * * In military service it is of the most vital importance that this leader have experience and special qualifications to fit him for that position. It is for this reason that we have officers and enlisted men in the military services. This is true of every military organization in the world, and it is true of all forms of business conducted on a large scale.

The pharmacist who severs his connection with the colleagues of civil life to enter a military service appears to have acquired many masters, and to be at the beck and call of men who are not qualified to direct him in the details of his calling. He finds himself in situations very different from those of civil life, but these situations all have their parallel ashore. The man who stands behind the counter must be the servant of his patrons; the head of the retail store is very directly and constantly affected by what goes on in the wholesale trade; and the big wholesaler and importer is dependent for success on the trade conditions and political conditions existing throughout the world. Everybody has a boss, whether that boss is outwardly marked by a uniform and devices or has no earmarks by which the uninitiated public can distinguish him at a glance.

The American Pharmaceutical Association is an organization which has stood the test of time and has an all-powerful influence on the destinies of its individual members. It represents pharmacy and things pharmaceutical. To enumerate the beneficial things done by the American Pharmaceutical Association in general is not within my power, but it is my desire to express to you the gratitude of the pharmacists of the naval service for the many activities which have been so helpful to us, and, in the name of the naval pharmacists, I most heartily thank you for these beneficial acts.

Before any organization can render the greatest good for the amount of energy expended on behalf of those of us "who go down to the sea in ships" it is highly desirable that the duties, responsibilities, and activities of the naval pharmacist be thoroughly understood. The practice of medicine and surgery at sea, and especially in a military organization, is very different from that ashore, and to even a greater extent the practice of pharmacy, under the circumstances of naval life, is likewise so different that it is in the nature of a specialty within a specialty.

THE NAVY HOSPITAL CORPS.

In order to appreciate just what a pha macist in the Navy is, let us go for a moment into the history of the Hospital Corps. The naval pharmacist of to-day is a product of the gradual

evolution of the Medical Department which began with the establishment of our Navy and has gone on to the present day. The present pharmacist bears the same relation to the sick-bay attendant of earlier days that the highly qualified medical officer does to his predecessor of a century ago; that the self-respecting, ambitious, clean-cut, clear-eyed, young American sailor of our modern battleship bears to the rough, rum-drinking bluejacket formerly recruited from a regular seagoing class, brought up on the wind-jammers of the merchant service that carried our flag to every seaport in the world. We may get a conception of the radical changes which have taken place by contrasting the laws and regulations in force in this year, 1920, with those of the early Revolutionary period.

In 1794 Congress enacted a law for certain commissioned and warrant officers. Among those provided for were physicians, termed surgeon's mates, who were allowed $30 per month and two rations per day, with one-half pint of distilled spirits per day, or in lieu thereof one quart of beer per day for each ration. This sounds rather attractive, but one shudders at the thought of the weevils in the bread, the salt meat or salt horse, as it was called, stored in the appropriately named harness cask; at the long voyages without cold-storage or refrigerated food; the undistilled drinking water, the dark, ill-ventilated cockpit where the surgeon cut off arms and legs without anesthetic. What misery was endured by the sick and wounded of those days! There was no provision for hospital corpsmen, the surgeon having for his assistant, nurse and handy man, an individual known in the Navy as a bayman, too often an ignorant, rough, untrained, though well-meaning, individual, picked up from among the misfits of the sailing-ship's crew and assigned to the somewhat rough-and-ready doctor of the time.

The next step was the apothecary, a druggist of the period of 1870 to 1898, appointed from civil life for service on board ship for a stated period or for a definite, but always long, voyage. The next advance was secured by an act of Congress approved June 17, 1898. This law provided for the rank of pharmacists and the enlisted ratings of hospital apprentice first-class and hospital steward, and was in reality the birth of the Hospital Corps which grew out of an absolute necessity through the aim of the Medical Department of the Navy to keep fully abreast of developments ashore.

For many years the Hospital Corps of the Navy was not properly appreciated, and there was no adequate provision for promotion and so no inducement for good men to join our ranks. From hospital steward the next step was to the warrant officer grade of pharmacist. For a young man in the Hospital Corps who had had no previous pharmaceutical education it was a very hard matter, indeed a matter of years, to reach the grade of hospital steward. He had to educate himself in order to be capable of passing the requirements for promotion to that rating.

The man who was a graduate of pharmacy, possessed of a good preliminary education, and was temperamentally fitted for military life, would soon acquire the necessary service qualifications to pass the examination for hospital steward, but it took even a man of this type years to qualify for naval pharmacist, on account of the peculiar duties, responsibilities, and educational requirements of this grade.

Since the establishment of the Hospital Corps in 1898, the legislation which has accomplished the greatest good for us to date was the act of Congress approved August 29, 1916, which reclassified the Hospital Corps of the Navy, so as to have it conform to the other enlisted or enrolled branches of the service, by creating the ratings of petty officer first-class, corresponding to sergeant in the Army, and petty officer second-class, corresponding to corporal in the Army, and changing the designation hospital steward to chief pharmacist's mate, and the petty officers to pharmacist's mates first-class, second-class, and third-class.

The reorganization of the Hospital Corps in accordance with this was was rapidly accomplished, and under this new scheme the expansion was wonderful and an incentive to better himself was furnished to every actual and prospective member. This legislation was a step in the right direction, and it is certain that it showed excellent judgment on the part of the Medical Department of the Navy and of Congress.

April 6, 1917, saw the Hospital Corps of the Navy with some 6,100 enlisted members and 44 pharmacists and chief pharmacist's mates preparing in time of peace for an emergency which was soon to come. Seven months after the declaration of war the Hospital Corps had expanded to meet the emergency. On July 1, 1917, there were 44 permanent and 54 temporary pharmacists, 6,000 regular and 4,000 reserve enlisted members. One year later there were 82 pharmacists

who had been granted temporary commissions in the Medical Corps and 22 chief pharmacist's mates who had been promoted to temporary pharmacist and 16,000 enlisted men in the Hospital Corps. The member of the Hospital Corps who served with the Marines in France in such encounters as occurred in the Chateau-Thierry sector, at Belleau Wood and Bouresches, in the Soissons sector at Vierzy, in the Toul sector at Pont a Mousson, in the St. Mihiel salient at Thiaucourt, in the Champagne section at Blanc Mont, and in the Meuse-Argonne section from Sainte Georges to Mouzon, not only maintained the long-established record for active, honorable, praiseworthy, and often heroic conduct in action against the enemies of our country, but won new and beautiful laurels.

In all the long history of worthy deeds performed by hospital corpsmen, never have there been more notable displays of heroism, greater deeds of valor, or more courageous acts under the most gruesome tests than were performed by these who had the privilege of serving in action with the soldiers of the sea on the battlefields of France.

Of these fortunate few, comparatively speaking, who were with that renowned organization of fighting men overseas, 12 were killed and 101 wounded and gassed. One was taken prisoner; 1 was cited for, 63 were awarded, and 33 recommended for the French croix de guerre; 19 were awarded and 22 were recommended for the distinguished service cross; 1 was cited for the French medaille militaire, and 24 were cited in Army General Orders.

The enlisted members of the Hospital Corps are to-day highly trained all-around men. They are recruited from all walks of life, preference being given to the high school graduate and the man with a knowledge of pharmacy, chemistry, embalming, etc.

The chief pharmacist's mate is the senior of the complement of enlisted hospital corpsmen allowed on a battleship. He is the medical officer's right-hand man. He supervises the sick bay, which is the ship miniature hospital, and assists the medical officer in surgical operations, in giving anesthetics, and in performing various sanitary duties. He assigns the other members of the Hospital Corps to their duties and performs most of the clerical work of the medical department. He must be an absolutely reliable first-aid man, capable of detecting contagious cases and isolating them; of differentiating the serious medical and surgical cases from those of minor importance, so as to be able, unfailingly, to pass on to the medical officer all those requiring the latter's special care.

One may say, "Why should a naval hospital corpsman be required to know these things?" For one thing, the Navy is limited by law as to the number of doctors, and the Medical Department finds that it has not a sufficient number to be able to assign one to each vessel. Therefore, a hospital corpsman must be trained for independent duty; that is, duty on board a small craft or at smaller and less frequented and often remote short stations. He is not a physician or surgeon, nor supposed to be one, but in many emergencies he does have to perform the duties of a doctor, and he should be able to acquit himself creditably and yield a maximum of help in case of accident or epidemic. Though a torpedo boat may have a crew of 120 or more men, no medical officer is assigned to it. To each individual torpedo boat the Medical Department, with perfect confidence, assigns a chief pharmacist's mate, knowing that he is qualified to meet most of the usual cases and emergencies as they arise. On boats of this type the chief pharmacist's mate is often required to perform minor surgical operations, and he has to be on constant watch for contagious cases and to keep infections to a minimum. Torpedo boats operate in units, and for each group there is a parent ship, or tender, carrying several doctors and equipped with ample medical and surgical outfits. During the war, of course, the responsibilities of the pharmacist's mate on our torpedo boats were greatly increased, and our men earned universal and unstinted praise by their work. On these vessels the chief pharmacist's mate will often recommend in writing to his commanding officer sanitary changes which he deems imperative regarding the intake of air, the sewage system, the kind and quality of food or clothing, and the habits and condition of the crew.

I remember one case in particular, during the war, where a naval overseas cargo boat had put into a river port and tied up. The chief pharmacist's mate on board had gone ashore to investigate the prevalence of contagious disease in the town, and when he returned he informed his commanding officer that he thought it undesirable to take water on board from the river for drinking purposes. The commanding officer approved his recommendation and issued the necessary instruction. The engineer officer, however, took on a supply for use in the boilers.

This water being stored where it was handy for members of the engineering force, some of them drank it and came down with enteric trouble. They were thus rendered unfit for duty before passing through the war zone, which seriously handicapped the ship. Imagine what might have happened to the entire crew if this hospital corpsman had not investigated and made his recommendation. From this type of hospital corpsman the naval pharmacist is developed.

QUALIFICATIONS.

The naval pharmacist, first of all, must have considerable executive ability. He must be capable of handling men and commanding their respect. He must be subordinate to those in authority over him, and at the same time able to win the respect of the medical and other officers with whom he is closely associated. He must have a broad knowledge of the internal administration of a naval hospital, and must be thoroughly familiar with the subjects taught in a college of pharmacy, and with such allied subjects as X-ray, bacteriology, and serology.

At a naval hospital and on board a hospital ship the pharmacist is the right-hand man of the medical officer in command and of his executive surgeon. He has immediate charge of all the clerical, statistical, and administrative details. Under his supervision are prepared for the Navy Department all the statistics of the institution, and at the department another pharmacist prepares the vital statistics of the entire Navy. The records and pensions division of the Medical Department of the Navy is a big work, its live file covering, as it does to-day, three wars—the Civil, Spanish, and World War.

The naval pharmacist at our large medical supply depots, under the medical officer in command, procures all medicines, surgical instruments, textiles, hospital furniture, and supplies issued to the service. He passes upon the quality of all these to see that they meet requirements, and in the case of drugs, the specifications of the United States Pharmacopoeia. He must have sufficient knowledge of contract law to protect the Government against fraud. He must be able to prepare specifications for many and diverse things—from laundry machinery, ice-making machines, and electrical equipment at a hospital to kitchen ranges, household furniture, and such things as delicate and complicated surgical instruments and appliances and, last but not least, X-ray machines. One of the important assignments for a naval pharmacist is the management of the commissary department. For this, besides business training, he must have some understanding of the caloric and nutritive value of foods and of the classes of diets suitable for the sick, so as to prepare proper menus for the sick and staff, after he has procured the articles of food and submitted them to rigid investigation both in the raw state and after preparation.

For the development of the Hospital Corps the Medical Department has established primary and advanced schools, and the naval pharmacist is assigned to these institutions as an instructor. If a pharmacist is particularly able, and has teaching ability, he will gravitate to one of these schools. He must be capable of teaching any one of the subjects in the curriculum, not only those strictly pharmaceutical in nature, as pharmacy and chemistry, but hygiene, bacteriology, nursing, first-aid and minor surgery, anatomy, and physiology. In his capacity of commissioned officer he is often required to do duty in connection with courts martial, where he is not only a juryman but a member of a court dispensing military justice.

X-RAY WORK.

The naval pharmacist often becomes a proficient technician in X ray work, and the Medical Department allows every opportunity for the pharmacist to study and acquire a knowledge of the physics of the Roentgen ray. It is highly desirable for him to possess a knowledge of the chemistry of photography, and not a few of our men become experts in interpreting shadows of X-ray photographs. He, of necessity, has a sufficient knowledge of electricity to intelligently manipulate the machine, and will often locate a defect and make the necessary repairs. You can perhaps realize the importance and difficulty of drawing up specifications for an X-ray machine when I tell you that the regulations of the Navy, in order to be fair to all manufacturers, prohibit specifications which would allow only the delivery of a machine of a special type. So you see the naval pharmacist must have some knowledge of volts, amperes, cycles, and transformers, to say nothing of X-ray tubes, such as Coolidge and vacuum, and water-cooling apparatus. In bacteriology the naval pharmacist is often called upon to make blood counts, make and stain smears of blood, pus, and sputum. He has quite a familiarity with Gram negative cocci, tubercle bacilli and tests for occult blood. He examines feces for eggs of worms, and makes analyses

of urine and water. He often prepares culture media, vaccines, and antitoxins. The naval pharmacist being assigned by naval regulations as the commissary officer of a hospital must be capable of examining food material of all kinds, of testing for adulteration and preservatives and of determining whether or not meats are fresh or cold storage, and in every way fit for human consumption. He makes physical tests of fabrics, and determines the tensile strength of such important items as suture material.

There has been agitation in some quarters against military service on account of the fact that graduate pharmacists are required to enlist as if enlisting in the military service of the Government was a stigma on one's character. I believe that this brief outline of the character of the service rendered has proved to you that the three-year period one is required to go through as an enlisted man of the Hospital Corps, passing through the grades of pharmacist's mate, third-class, second-class and first-class to chief pharmacist's mate, there to become eligible for examination for the officer grade of pharmacist, is not an excessive one. Let me say in this connection that one of the main reasons why the graduate pharmacist does not win out in competition with the man of the service is because he has not the basic educational qualifications. This is true academically as well as professionally. The graduate of a reputable high school without a pharmaceutical education is handicapped in the Navy, but not so much as the sixth or eighth grade grammar school man who may be a graduate pharmacist. The high school boy, if diligent in his studies, will in the long run win advancement to the higher rank. He may not be promoted to chief pharmacist's mate first, but in the large percentage of cases his progress will be steadier and when he reaches the grade of chief petty officer he will be better equipped for the examination for promotion to the warrant rank of pharmacist in the Navy than the graduate pharmacist who has not the preliminary educational attainments. This can be remedied if you gentlemen of the civilian branch of the Association will compel your schools to raise the entrance requirements and at the same time to lengthen the course at the pharmaceutical college. It is not only in entering the Hospital Corps that special training is needed to meet the military and other requirements of the service.

The Medical Department, after examining a graduate of medicine from a class A + medical school (requiring college work for entrance), requires this physician, regardless of his professional standard and the fact that the duties he is to perform are (outside of those purely military) professional, to attend a six months' course at the Naval Medical School here in Washington to fit him for his naval career.

The needs of the sick at sea and in military life generally are so modified by a thousand differences in all the attendant circumstances that those who minister to them in any capacity are required to have radically different training from the corresponding service ashore. This thought must be ever in the minds of those who would like to better the standing of the naval pharmacist. With the best intentions in the world you cannot, through influence or legislation, force upon the service types of men or women with the kind of training not adapted to our needs.

AFLOAT AND ASHORE.

A widely prevalent misconception among my civilian colleagues is that if a man is a good chemist, a good dispenser, a good salesman, and able to command a good salary ashore, he should at once be eligible for a commission as a pharmacist in the Navy. We have nothing to sell in the Navy, and compounding and dispensing is a relatively small part of what our high-grade hospital corpsmen have to do. When in the past we have told this to our friends of the American Pharmaceutical Association, the answer generally was, "Well, you do have some places for chemists and dispensers. Give our good men commissions and place them in these positions, and get others to do the nursing and clerical work and anything else you may require at sea." Now, it must be understood once and for all that no branch of the Navy can have two sets of men, one to do the work ashore and the other at sea. Please do not forget that the people who go to sea are human beings. Their natural habitat is terra firma. If we are to get men for the ships we must promise them their due turn ashore. In other words, our men must alternate duty.

If you will give us men of education we can guarantee them promotion. That we have any standing in the Navy to-day, nay, that we have a very high standing, is due to the fact that for years we have been getting men who thought less of money than of other things. They had energy, patience, and ability. They made work for themselves in the Navy; they developed

and enlarged their functions, and made themselves more and more useful by opening up new avenues of endeavor. Here and there a man of this type did so well as a commissary officer, as an administrator, as an organizer, and director of men, that when he went elsewhere he left a void and there was a demand for another like him.

I have been asked to tell you gentlemen what the Navy has to offer a graduate pharmacist with a sound foundation of general education. He is required to enlist as a hospital apprentice first-class. I know you object to the word apprentice, but why object to the honest statement of an honorable fact? He begins an apprenticeship in a line of work which cannot be learned elsewhere, a line of work indispensable to the functions he must exercise later on, when he becomes the leader, teacher, and officer. While in this rating he learns the military side of naval life; he learns to function as a petty officer, and it is in this rating that he is sent to one of the various preliminary hospital corps schools to learn nursing, the care of the ward and the sick, to become an assistant to the surgeon. Upon graduation he is advanced to pharmacist's mate third-class (I am speaking of the graduate pharmacist, not the layman; he is graduated in a lower rating); then he is transferred to the general service to compete for promotion. In three months he may become a pharmacist's mate second-class at $72 per month and food.

Now, mind you, this man has just served his apprenticeship. Six months after being made pharmacist's mate second-class he may be advanced to pharmacist's mate first-class at $84 per month and food and room. One year after that promotion he may be advanced to chief pharmacist's mate at $99 and board, doctor's bill paid, etc. (It is at this stage that he becomes eligible to compete for pharmacist.) One year later he may, if he has not been promoted to pharmacist, be eligible for a permanent appointment as chief pharmacist's mate at $126 per month and board. Do your graduates in civil life have equal opportunities to save?

Should he be successful in being promoted to pharmacist he then has an ideal position with a fair salary and allowances for quarters, heat, and light, which at present may be from $1,760 a year to $3,600, according to length of service, travel, etc. Should Congress at this time recognize pharmacy by granting commissions in the Army and Navy to those qualified under service conditions, it behooves the pharmaceutical colleges to raise their entrance requirements and lengthen their courses and to live up to the dignity of their profession.

I was glad to hear Professor Cook, in his testimony before the Congressional Committee on Naval Affairs, state that the colleges of pharmacy were working for, at least, the full four years' high school course for entrance and a full four-year course at the college and in this respect it is noted with interest that several leaders of pharmacy advocate the same preliminary stages. To quote from an article by Prof. R. A. Lyman, in the April *Druggists Circular*, "There are certain steps which seem to be necessary in order that Pharmacy may keep pace with the related professions. We may differ as to the best methods of bringing about desired results, but as to the necessity of making certain changes there can be no question. The time has come when a four-year high school course and a four-year technical college course should be the minimum educational requirement for any profession." * * *

The growing tendency to commercialism is the great menace of our profession. It must be offset by ever-rising standards of professional ability and by a systematic expansion of our general educational requirements. The world is going ahead and we must move with the rest, and if we are to occupy a large and high place we must have something more to take us through than just a keen scent for the almighty dollar. The one mixture that never fails is the mixture of brains, character and knowledge. Send into the Navy the men so compounded and they will get their due.

The Chair called upon Mr. George M. Beringer to respond to Major Clarke and Lieutenant Dickens and the Secretary was directed to send a letter of thanks to Surgeon Generals Ireland and Braisted.

Chairman Hilton announced the following appointments: Committee on Nominations, Robert P. Fischelis, *Chairman*, Francis G. Schachleiter and Diodato Vilamena. Committee on Resolutions, Henry P. Hynson, *Chairman*, Charles H. LaWall, Henry M. Whelpley, John Cully and W. Bruce Philip.

Mr. Clyde L. Eddy now read a paper entitled "The Future of the War Veterans' Committee. (See JOURNAL A. PH. A., June 1920, p. 609.) Chairman Hilton and Recording Secretary Hostmann rendered brief verbal reports. The Chair called for resolutions. None were pre-

sented. The Committee on Federation reported progress. The report was approved and it was voted to continue the committee.

Vice-Chairman Kelly assumed the chair and called for the discussion of the "Newcomb Plan for Organizing American Pharmacy." Upon motion it was decided to make the discussion a special order of business for the Second Session.

Adjournment was voted at 5.30 P.M.

SECOND SESSION.

Chairman Hilton presiding. The minutes of the preceding session were approved as read in abstract.

Vice-Chairman Kelly assumed the chair and called for the special order of business, the discussion of the "Newcomb Plan." Prof. Newcomb described the plan in great detail. After a lengthy and thorough discussion it was voted to refer the Newcomb Plan for Organizing American Pharmacy to the Executive Committee of the A. Ph. A., with the request that it bring the plan before all other national pharmaceutical bodies.

H. B. Smith, of New York, read a paper on

ORGANIZING AMERICAN PHARMACY.

Many complicated and cumbersome plans have been suggested for the coördination of pharmacy in this country.

The retailer is the first and should be the last consideration for every plan of consolidation.

Everything is dependent upon him. He pays the bills, most of the freight, and shoulders the losses.

The American Medical Association is a unit in its interest for the physician.

The American Chemical Society fathers the interests of the Chemical Industry.

Many other organizations concentrate the interests of their several trades.

Pharmacy should do likewise. Every local and state association should unite with the national in one grand body, presenting an unbroken front to anything inimical to their interests.

We have been kicked and cuffed in so many ways that like the old saying, "It's a long lane without a tin can in it." It's time we put a fuse on that tin can, put in a good charge of powder, and mean business. Some of us may lose a little prestige, but it will be for the ultimate benefit of Pharmacy.

The success of the Allies during war times aptly illustrates what can be accomplished by coöperating under one head. Time, money and energy can be saved and better results obtained. Every organization pharmacist in the United States could be a member with the privilege of the floor when attending conventions. But there should be a delegate attending these meetings for every five hundred or less members of our state associations to voice the sentiment and troubles of their local co-workers. In line with this thought I would suggest that we unite under the best name for such a body.

The American Pharmaceutical Association, with a President, Treasurer and Secretary. Call them Grand President, Grand Treasurer and Grand Secretary, if you desire.

Three major subdivisions, each controlled by a Vice-President, Assistant Treasurer and Assistant Secretary, or President, Treasurer and Secretary, if desirable.

Section 1. Subdivided A and B.

A. Scientific Subjects Research Work, etc.	B. Historical, etc.

Section 2. Subdivided A, B, and C.

A. Educational Boards of Pharmacy	B. Practical Pharmacy Dispensing, etc.	C. Pharmacopoeial Revision

Section 3. Subdivided A, B, and C.

A. Commercial Interests	B. Legislation	C. Publicity

The vice-presideats of each section to be responsible for their immediate section's interest and appoint their various committees. The detail of this plan, I think, can be worked out very harmoniously and quickly and with very little friction, by a committee from all interests involved. Concluding, may I suggest the appointment of such committees.

Respectfully submitted,

H. B. SMITH,

Kings County Pharmaceutical Society, Brooklyn, N. Y.

After discussion it was voted to refer the paper to the Committee on Reorganization of the A. Ph. A.

The following resolution was received from the Section of Education and Legislation. It was unanimously adopted:

RESOLUTION ON NARCOTIC TRAFFIC.

WHEREAS, The last few years have witnessed the renewal of the use of narcotics by the people of China in a way even more deadly and dangerous than the opium from which the nation recently freed itself by a heroic moral effort, this renewal of narcotics being the use of morphia and similar drugs; and

WHEREAS, The Government of the United States entered into covenant with the Governments of China, Japan, Great Britain and other nations at the Hague Conference, in 1912, whereby stringent and effective measures were proposed for the protection of China and other countries from such drugs; and,

WHEREAS, The full execution of these protective measures has been hitherto restrained by the non-participation of a few nations, namely, by lack of signatures of one Latin-American nation and three or four minor European nations; now, therefore be it

Resolved, By the American Pharmaceutical Association that the Congress of the United States be urged to give immediate effect to these measures without waiting for their full ratification; and,

Resolved, second, That we applaud and join in the recent action of the Conference of the British Chambers of Commerce assembled at Shanghai in "urging upon the British Government to control the production of such habit-forming drugs and to limit their production to the amount required for legitimate medical use, and to limit their export to such countries as have established laws and regulations which effectively control the traffic in these drugs and restrict their use to legitimate purposes only;" and

Resolved, third, That we respectfully urge American manufacturers, importers and dealers in narcotic drugs and alkaloids, to refuse to accept orders for these commodities from Japanese firms except in those cases in which the order is accompanied by a guarantee from the Japanese Government that the articles are intended for medicinal use only, and that they will not be re-shipped from Japan.

The Committee on Nominations presented the following:

For Chairman, E. F. Kelly, Maryland; Vice-Chairman, J. G. Beard, North Carolina; 2nd Vice-Chairman, A. Wirth, Louisiana; Recording Secretary, Jeannot Hostmann, New Jersey.

Upon motion, regularly made, the Chairman of the Committee on Nominations cast a ballot, unanimously electing the above as officers for the ensuing year.

Adjournment was voted at 5.15 P.M.

Attendance 78, representing 28 state associations and 56 non-voting associations.

JEANNOT HOSTMANN, *Recording Secretary.*

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."— By-Laws, Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter. To maintain its activity and representation each Branch should see that at least three of its meetings during the year are reported in the Journal.

CHICAGO.

The 113th meeting of the Chicago Branch of the American Pharmaceutical Association was held Thursday evening, Nov. 18, 1920, at the School of Pharmacy Bldg., with President A. H. Clark in the Chair.

President J. J. Possehl, of the National Association of Retail Druggists, led in the discussion of the evening on the subject, "The Future for the Young Man and Woman in Pharmacy."

A paper by Professor A. H. Clark on "Ointment of Zinc Oxide" was presented in abstract and approved for publication.

The meeting was well attended, with many pharmacists present, including members of the Executive Committees of the National Association of Retail Druggists and of the Illinois Pharmaceutical Association.

ECHOES OF THE MEETING.

President J. J. Possehl: "Just so long as people seek the advice of their physicians, just so long will there be a future for the professional pharmacist. Remuneration to the extent of a good livelihood is always certain in pharmacy, and pharmacy will repay you to the full extent of what you put into it, and remember that service to your community brings greater returns than monetary achievement. The dispensing doctor is not proficient in his own profession and therefore tries for success in another."

Secretary Samuel C. Henry: "There is nothing that grates on me quite so much as to hear a pharmacist decrying his profession. Long hours. When I entered pharmacy I had nothing in the world to do but open the store at 7:00 o'clock in the morning, and, if no one was in the store, close it up at 11:00 o'clock at night, and for this was paid the handsome remuneration of $75.00 per year, payable quarterly. Haven't conditions changed somewhat since then? If we have aided in the uplift of our profession, even if we haven't accumulated wealth, our lives are well spent."

J. F. Finneran, Chairman of the Executive Committee, Boston, Mass.: "The pharmacy of the future will be just what we make it, and will depend upon our idea of service. Show me the junior drug clerk, who, when a physician of his acquaintance comes into the store, has some newly made preparation to show with favorable comments upon it, or an especially nice sample of digitalis leaves recently received, and I will show you a future successful pharmacist. We should have only one thought regarding the quality of the medicines dispensed: Is this particular thing I am now dispensing good enough for my mother or a member of my family? The best friend you have in the world is a good competitor."

Chas. H. Huhn, Minneapolis, Minn.: "The meetings of the American Pharmaceutical Association, both national and in the local branches, and the meetings of the National Association of Retail Druggists and its local societies constitute a wonderful post-graduate course in pharmacy, bearing upon the scientific and business sides, respectively."

Walter H. Cousins, Dallas, Texas: "If you want to hear something from me, send me home to the quiet of my study, and I will write you a letter, voicing my opinions on this important subject."

John H. Webster, Detroit, Mich.: "We do believe in the future of pharmacy. One of my ambitions now is to raise my boy to be a pharmacist, and if a had a girl, I should want her to be a pharmacist too. The professional side of pharmacy is not vanishing. The future success of the young man or woman in pharmacy depends largely upon early training, not only in school but in business."

J. H. Riemenschneider, Chicago: "In a

recent local gathering of business men of many diverse lines someone said to me, 'He was lucky, he went into the drug business.' There is no such thing as luck. To make a success you must like the business you are in. I have been interested in pharmaceutical organizations since my youngest days in the drug business, and never yet have attended a pharmaceutical meeting without feeling that I have been well repaid for attending. In conversation recently with the wife of a former clerk of mine, who has been very successful in his own store, she said, 'I am proud not only of my husband's business success, but especially of his standing in the community.' "

C. J. Clayton, Denver, Colo.: "My going to work in a drug store was just a happen-so, and I wonder if that isn't the case with many young men and possibly young women who enter the drug store as apprentices. I well remember my first lesson in Latin. My preceptor pointed to the stock bottle label 'Sapo' and said, 'Now that stands for soap. You see, it is just the word soap turned around.' With happen-so beginnings and ignorant preceptors, isn't it surprising that pharmacy has been favored with so many broadly successful men and women? Our *business* is the practice of pharmacy, but we sell other things to make a living. We are not profiteers, but rather 'Pikers,' not being paid properly for our professional service. Don't be afraid of being classed as a professional man."

Sidney Schmidt, Chicago: "Each one should spread the gospel that pharmacy is a worthy profession and encourage rather than discourage young people going into pharmacy. Drug clerks are no longer washing bottles, scrubbing floors and washing windows, because the proprietor has found out he cannot afford to pay forty, fifty, or sixty dollars a week to highly educated men for that kind of work. In fact, as a young man lately entered into pharmacy, I am convinced that the recent marked increase in salaries will have a far-reaching influence in the uplift of pharmacy as a recognized profession."

Thomas Potts: "The infamous night bell! How thankful we may be that is gone forever. It isn't every young man or young lady who is adapted to the retail drug business. When you find yourself adapted to this business you can make it a life-work, and if you are incapacitated by sickness or age, your business, in the hands of competent persons, can be profitably continued. This is not generally true of the physician, dentist or lawyer."

William B. Day, Chicago: "Students of pharmacy have a great advantage over other college students, in that they get business experience before attending school and while in school; and this contact with the world must be acquired by all young persons before they are worth much in business. As long as the race endures, there will be illness, and drugs will be needed. We have had many croakers who prophesied that the drug business was 'going to the dogs,' for one reason or another, but I am convinced that there is no need for any young person now entering pharmacy or contemplating pharmacy as a life-work to be discouraged. It has been said that the professional side of pharmacy was becoming extinct, but I am firmly of the opinion that the professional side of pharmacy is just entering into its own and will soon receive greater recognition, and this because higher preliminary and professional training is now demanded of the young people entering pharmacy."

E. N. GATHERCOAL, *Secretary*.

DENVER.

Regular meetings of the Denver Branch A. Ph. A. were held May 25 and June 15; the latter was the last meeting of the season. September 14 the sessions of 1920–1921 were opened; the minutes of the meeting October 19 are reported in full, the others in brief abstract.

Fifty-six members were present at the May meeting; ten new members were elected. Letters from two Colorado Senators and two Congressmen were read, re H. R. Bill No. 8078; three were in favor and one against the bill. The Price Book was further discussed. See JOURNAL A. PH. A., p. 614, and JOURNAL A. PH. A., p. 424. John A. Martin spoke on his methods of doing business.

The meeting of June 15 was Ladies' Night, and given over to a dinner at *Elitchs Gardens*, followed by a dance. This was attended by nearly all the members and many invited guests.

Fifty members were present at the meeting of September 14; five new members were elected. It was announced that the Price Book was ready for distribution. Chas. J. Clayton spoke of the weekly service offered to the drug trade of Denver, and Colorado. The Price Book is alphabetically arranged and indexed for convenient reference. There

is much valuable general information in it besides the prices. It was stated that Denver druggists were closer to each other than ever before.

OCTOBER MEETING.

The Denver Branch of the American Pharmaceutical Association held its regular monthly meeting Tuesday Eve., October 19, 1920, at the Metropole Hotel. The meeting was preceded by a dinner.

President Gregory being out of the city, Vice-President F. J. Lord presided.

Chas. J. Clayton was called upon to relate the interesting details of his visit to St. Louis while in attendance at the N. A. R. D. convention. Mr. Clayton's remarks were interesting and instructive, and it seems as though more of us should attend the annual N. A. R. D. conventions. This may be realized next year, however, as Mr. Clayton and Mr. Wilson extended to the N. A. R. D. Association invitation to meet in Denver next year.

L. Wilson seconded Mr. Clayton's talk in everything that was done for the good of Pharmacy by the convention. Mr. Wilson also urged upon us the need of organization, and the necessity of sticking to the organization.

H. B. SeCheverell offered a few remarks on the legislative side of pharmacy; these were supplemented by Messrs. Clayton, Wilson and D'Amico. All spoke about the futility of the efforts of legislative committees unless they received the full coöperation of all the druggists of Denver, and Colorado. Let us pull together and see if we can't have a few bills passed, more favorable to pharmacy in Colorado in particular, and the country in general.

Mr. Wheatcroft of Chicago, a worker in the interests of the N. A. R. D., offered a few remarks and, especially, urged all present to work toward the goal of real organization and therefore coöperation.

Mr. Tripenny, a druggist from Casper, Wyo., favored us with a short talk, and told what the druggists of Casper and Wyo. were doing. Conditions there are better in many respects than in Colorado. Mr. Clayton had a few remarks to offer relative to the Price Book, and the service given by him. It is earnestly hoped that the druggists of Denver and Colorado will give this undertaking their full support, as there is no better way for them to improve their conditions than by subscribing to this very worthy undertaking.

Mrs. R. A. White and Mr. M. P. Givens furnished the music of the evening, and their short entertainment was warmly received.

R. A. WHITE, *Secretary.*

DETROIT.

Prof. Edsel A. Ruddiman's paper on "Glycerin and Its Functions" was the principal feature of the November meeting of the Detroit Branch A. Ph. A.

His paper dealt with all the Elixirs, Syrups and Solutions of the U. S. P. and N. F. containing glycerin. The preparations reported on were compared with samples in which water, glucose, invert sugar and syrup, respectively were substituted for glycerin, all of which were under observation for a period of two years. In nearly all of the preparations to which his work was confined the use of glycerin in small percentages did not appear to be of any particular advantage insofar as solution or preservation was concerned.

After the reading of the paper a lively discussion followed.

The meeting, which was preceded by a dinner, was exceptionally well attended.

Officers of the Detroit Branch are:—Walter M. Chase, *President;* Charles H. Stocking, *Vice-President;* Frederick F. Ingram, Jr., *Treasurer;* Crosby B. Washburne, *Secretary;* and John C. Moore, *Chairman Program Committee.* CROSBY B. WASHBURNE, *Secretary.*

PHILADELPHIA.

The November meeting of the Philadelphia Branch of the American Pharmaceutical Association was held at the Philadelphia College of Pharmacy and Science Tuesday evening, November 9, 1920, President Goodhart presiding.

The minutes of the previous meeting were read and approved. Anthony Derrico was proposed for membership and on proper motion the secretary was directed to cast the ballot electing him. Communications were read from several sources referring to newspaper reports of the last meeting which were somewhat confused.

There being no further business the scientific program was started by Dr. Edward Kremers of the Course in Pharmacy of the University of Wisconsin, and Director of the Wisconsin State Pharmaceutical Experiment Station. His subject was "Twenty-five Years of Research in a Typical American Genus of Plants." Dr. Kremers spoke of his investiga-

tions with the constituents of several species of the Monarda genus. He called attention to the relation between all these constituents insofar as they were isomers of each other and oxidation products of each other. By following the chemical changes of these plant principles through succeeding stages he was able to establish a definite relation between the odors and colors of the different species. Dr. Kremers emphasized the fact that there was enough waste sandy soil in the United States on which sufficient *Monarda punctata* might be raised for the world's supply of thymol. Dr. Kremers' paper was discussed by Messrs. LaWall, Beringer, Eberle, McNeary and Stewart, after which a rising vote of thanks was given him.

Samuel L. Hilton, President-elect of the American Pharmaceutical Association, was present and on being called upon for a word for the local branch spoke briefly on the possibilities for great work by the American Pharmaceutical Association and hoped that he might during his period in the President's chair be able to do some real service for the Association.

Dr. F. E. Stewart read a paper on "Shall We Reorganize the A. Ph. A.?" Dr. Stewart's paper discussed the various phases of activity wherein the American Pharmaceutical Association could be more efficient and pointed out the manner in which similar bodies managed their affairs. No definite plan of reorganization was suggested however. The subject was discussed by Messrs. England, Hessler, Sturmer, Beringer, Cook, Peacock, Hunsberger, Eberle, Griffith and McNeary. The consensus of opinion was that the present organization was satisfactory, only that greater zeal should be displayed in carrying out the work of the Association, and that, above all, sight should not be lost of the altruistic purposes of the Association. ELMER H. HESSLER, *Secretary.*

CITY OF WASHINGTON.

The November meeting of the City of Washington Branch, A. Ph. A., was called at 8.30 P.M. in the lecture room of the National College of Pharmacy, President DuMez in the chair.

The minutes of the last meeting were read and approved. A communication from Mr. J. W. England regarding subjects to be discussed at meetings was deferred until a later meeting for discussion, and one from Prof. W. L. Scoville regarding deletions from the National Formulary was put over until a special meeting could be arranged for a general discussion of the subject.

A communication from Prof. E. F. Kelly, with reference to a proposed joint meeting of the Baltimore branch with this branch to be held some time in January, was read. It was moved that the President and Secretary be instructed to extend an invitation to the Baltimore branch to meet with us at some date and place to be decided on by the President and Secretary. Carried.

The program of the evening was then taken up. Dr. C. E. Young, principal examiner of the Prohibition Unit, Bureau of Internal Revenue, delivered an address entitled, "Alcohol in Its Relation to the Druggist," which was discussed in great detail by Messrs. Hilton, Sayre, Bradbury and Richardson. The address will appear in a subsequent edition of the JOURNAL.

It was suggested in the discussion that new Treasury decisions ought to be brought to the attention of pharmacists as soon as issued, by publication in all of the pharmaceutical and drug journals. It was suggested that the sale of alcoholic beverages could be taken away from the drug trade and placed in the hands of the Health Departments, thus relieving the drug trade of the odium now cast upon it by being the sole legal medium at present for the retail sale of liquor.

Several suggestions for simplifying returns were made and it was urged that Compound Tincture of Cardamom be stricken from the list of preparations now classed as beverages.

After the discussion, Prof. L. E. Sayre, who was in Washington for a few days, told about his work on the Standards Committee and of his endeavors to have the Government Committee take up the consideration of standards of drugs not recognized in the U. S. P. and N. F., but which are, nevertheless, used to a large extent medicinally.

S. L. Hilton, newly elected President of the Association, was then called upon to speak, after which the meeting adjourned at 11.10 P.M.

H. C. FULLER,
Secretary.

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Conducted by H. V. Arny, Reporter on the Progress of Pharmacy, Chairman of the Committee on Research.

On these pages, each month, will be found a list of articles on pharmaceutical research that appear in the pharmaceutical and other scientific journals of the world. Whenever possible, the list appearing a certain month will record articles appearing in American journals of the preceding month and articles appearing in foreign journals will be recorded as quickly as possible after the journals reach the Reporter.

All articles appearing in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK, which will be issued as soon after the end of the year represented as editing and printing conditions permit. Those desiring abstracts immediately can obtain same for a fee of one dollar each by communicating with H. V. Arny, 115 West 68th St., New York, and arrangements can also be made for securing photographic reproduction of entire articles at moderate prices when such are desired.

PHARMACOPOEIAL REVISION.

Faser, H. M.
Some N. F. revision suggestions
J. AM. PHARM. ASSOC., 9 (Nov. 1920). 1088
Gray, William
U. S. P. revision suggestions
J. AM. PHARM. ASSOC., 9 (Nov. 1920), 1086

APPARATUS AND MANIPULATIONS.

Goedecker, H.
Apparatus for keeping solutions in vacuo
Pharm. Zent., 61 (Aug. 19, 1920), 469

PHARMACEUTICAL PREPARATIONS.

Buttin, L.
History of syrup of five roots
Schweiz. Apoth. Ztg., 58 (Oct. 7, 1920), 510
Dale, J. K.
Manufacture and uses of malt syrup
Bev. News, through *Pract. Drug.*, 38 (Oct. 1920), 25.
De Groote, M.
Non-alcoholic flavoring extracts
Pract. Drug., 38 (Nov. 1920), 38
Dezeine
Ampuls of morphine hydrochloride
J. Pharm. Belg., through *Pharm. Era*, 53 (Nov. 1920), 334
Éwe, G. E.
Effect of freezing on magma of magnesia
Am. Drug., 68 (Nov. 1920), 25
Fantus, B. and Snow, C. M.
Dentifrice formulas for the N. F.
J. AM. PHARM. ASSOC., 9 (Nov. 1920), 1103
Garrood, J. R.
Paraffin candles as first aid in burns
Brit. Med. J., through *Pharm. Weekbl.*, 57 (Oct. 16, 1920), 1278
Goldschmidt, T.
New zinc adhesive plaster
Pharm. Zent., 61 (Aug. 19, 1920), 471
Malmanche, L.
Syrupus iodotannicus
Bull. sci. pharmacol., through *Pharm. Ztg.*, 65 (Aug. 18, 1920), 621
Mertz, A.
Mustard poultice substitute
Dtsch. Med. Wschr., through *Pharm. Zent.*, 61 (Sept. 2, 1920), 503
Philips
Coating for poisonous tablets
J. Am. Med. Assoc., through *Am. Drug.*, 68 (Nov. 1920), 58
Sasse, O.
Volumetric assay of sublimate tablets
Pharm. Ztg., 65 (Sept. 8, 1920), 688
Sayre, L. E. and Patty, F. A.
Chlorinated disinfecting solution
J. AM. PHARM. ASSOC., 9 (Nov. 1920), 1093
Schmatolla, O.
Assay of compound solution of cresol, Pharm. Germ.
Pharm. Ztg., 65 (Aug. 18, 1920), 620
Willaman, J. J.
Levulose syrup in pharmacy
Science, through *Pharm. Era.*, 53 (Nov. 1920), 320

GENERAL BOTANY AND BACTERIOLOGY.

Bourquelot, E. and Bridel, E.
Biochemical test for glucose in plants
J. pharm. chim., 22 (Sept. 16, 1920), 209
Goris,
Composition of the tubercle bacillus
L'Union pharm., through *Pract. Drug.*, 38 (Nov. 1920), 36

Gutierrez
Staining malaria plasmodium
J. Am. Med. Assoc., through *Am. J. Pharm.*, 92 (1920), 751
Jöttan and Haarmann
Staining tubercle bacilli
Münch. Med. Wschr., through *Am. J. Pharm.*, 92 (1920), 757
Schaedel
Staining tubercle bacilli
Pharm. Weekbl., 57 (Oct. 23, 1920), 1315
Van Wisselingh, C.
Seed coats of the Centrospermeae
Pharm. Weekbl., 57 (Oct. 2, 1920), 1193
Youngken, H. W.
Plant associations
J. Am. Pharm. Assoc., 9 (Nov. 1920), 1052

THERAPEUTICS AND NEW REMEDIES.

Fantus, B.
Treatment of sick headache
J. Am. Med. Assoc., through *Pract. Drug.*, 38 (Oct. 1920), 25
Fargher, R. G.
Role of antimony in tropical medicine
J. Soc. Chem. Ind., 39 (Oct. 15, 1920), 333R
Zwaardemaker, H.
Radio-activity in life
Arch. Med. Physiol., through *Pharm. J.*, 105 (Oct. 23, 1920), 379

VEGETABLE AND ANIMAL MATERIA MEDICA.

Anon
Hesperidian fruits and oils
Am. Drug., 68 (Nov. 1920), 29
André, G.
Exosmosis of acids and sugars in orange juice
Compt. rend., through *J. pharm. chim.*, 22 (Sept. 16, 1920), 234
Bockemüller
Therapeutics of electro collargol
Dtsch. Med. Wschr., through *Pharm. Zent.*, 61 (Sept. 2, 1920), 503
Bodinus, Wasicky and Cappenberg
Therapeutics of shepherds purse
Apoth. Ztg., through *Pharm. Zent.*, 65 (Aug. 28, 1920), 647
Gadre, S. T.
Constituents of the root of Nerium odorum
J. Ind. Inst. Sci., through *J. pharm. chim.*, 22 (Sept. 16, 1920), 230.
Gascard, A.
Ceryl alcohol and cerotic acid of Chinese wax
Compt. rend., through *J. pharm. chim.*, 22 (Oct. 1, 1920), 276
Kroeber, L.
Therapeutics of shepherds purse
Heil-Gewürz. Pflanzen., through *Pharm. Ztg.*, 65 (Aug. 28, 1920), 647
Lewton-Brain, L.
Rubber-seed oil
Chem. News, 121 (Oct. 29, 1920), 206
Lifschütz, I.
The "oily acid" of wool-fat
Z. physiol. Chem., through *J. Soc. Chem. Ind.*, 39 (Oct. 30, 1920), 697A
Lloyd, J. T.
Insects used in medicine
Am. J. Pharm., 92 (Oct. 1920), 714
Perret
Chaulmoogra oil
Mat. grasses, through *Pharm. Weekbl.*, 57 (Oct. 23, 1920), 1301
Schmidt, J. M.
Pharmacology of Adonis vernalis
Am. J. Pharm., 92 (Oct. 1920), 702
Spokes, R. E.
American styrax
J. Am. Pharm. Assoc., 9 (Nov. 1920), 1055
Youngken, H. W. and Slothower, C. A.
Rhus venenata
Am. J. Phar., 92 (Oct. 1920), 695

GENERAL AND PHYSICAL CHEMISTRY.

Collins, H.
Constitution and structure of the elements
Chem. News, 121 (Oct. 15, 1920), 182; and 121 (Nov. 5, 1920), 219
François, M.
Accurate determination of melting points
J. pharm. chim., 22 (Sept. 16, 1920), 215
Scheringa, K.
Adsorptive power of filter paper and starch
Pharm. Weekbl., 57 (Oct. 23, 1920), 1289
Twyman, F.
Spectroscopy of powerful drugs
Analyst, through *J. Frank. Inst.*, 190 (Oct. 1920), 591
Volmar and Dufraisse
Apparatus to secure the photochemical rays from an incandescent lamp
J. pharm. chim., 22 (Oct. 1, 1920), 253

INORGANIC CHEMICALS.

Anon
Barium sulphate in radiology
N. W. Drug., 28 (Nov. 1920), 368
Chateau, H.
Titration of small amounts of mercuric chloride
Bull. Soc. Pharm., Bordeaux, through *Pharm. Ztg.*, 65 (Aug. 28, 1920), 648

DeBlasi
Sterilizing drinking water
Ann. d'Igiene, through *Am. J. Pharm.*, 92 (1920), 753

Denigés, G.
Microchemical detection of ammonia
Bull. Soc. Pharm. Bordeaux, through *Pharm. J.*, 105 (Oct. 21, 1920), 323

Iversen, P.
Volumetric phosphoric acid assay
Biochem. Zschr., through *J. Soc. Chem. Ind.*, 39 (Oct. 30, 1920), 707A

Joachimoglu, G.
Pharmacology of selenium and tellurium
Biochem. Zschr., through *J. Soc. Chem. Ind.*, 39 (Oct. 30, 1920), 704A

Kleinmann, H. and Feigl, J.
Phosphoric acid assays
Biochem. Zschr., through *J. Soc. Chem. Ind.*, 39 (Oct. 30, 1920), 707A

Kolthoff, I. M.
Colorimetric assay of ammonia, nitrites and nitrates
Pharm. Weekbl., 57 (Oct. 16, 1920), 1253

Kolthoff, I. M.
Precipitation of the calcium-magnesium group
Pharm. Weekbl., 57 (Oct. 2, 1920), 1229

Scheringa, K.
Adsorptive power of copper sulphide
Pharm. Weekbl., 57 (Oct. 23, 1920), 1294

Von Oefele, F.
Telluryl nitrate
Pharm. Zent., 61 (Sept. 2, 1920), 491

Winkler, L. W.
Sulphuric acid assays
Z. angew. Chem., through *Pharm. Ztg.*, 65 (Sept. 1, 1920), 662

Zuccari, G.
Volumetric nickel assay
Boll. chim. farm., through *Pharm. Zent.*, 61 (Sept. 2, 1920), 500

ORGANIC CHEMICALS.

Anon
Distinguishing between salvarsan and neosalvarsan
Chem. Zent., through *Pharm. Era*, 53 (Nov. 1920), 333

Anon
Sulpharsenol
J. Pharm. Belg., through *Pharm. Era*, 53 (Nov. 1920), 333

Anon
Trioxymethylene as mosquito larva killer
Compt. rend., through *Pharm. Era*, 53 (Nov. 1920), 333

Abbe, W. J. and Dickinson, R. E.
Benzin as plaster remover
J. Am. Med. Assoc., through *Pharm. J.*, 105 (Oct. 23, 1920), 379

Adams, Roger and Palmer, C. S.
Condensation of primary arsines with aldehydes
J. Am. Chem. Soc., 42 (Nov. 1920), 2375

Ague, J. L.
Preparation for emetine hydrochloride
Boll. Farm., through *Chem. & Drug.*, 93 (Oct. 2, 1920), 1364

Anderson, R. J.
Synthesis of phytic acid
J. Biol. Chem., through *J. Soc. Chem. Ind.*, 39 (Oct. 15, 1920), 673A

Annett, H. E. and Sen, H.
Codeine assays
Analyst, through *J. Soc. Chem. Ind.*, 39 (Oct. 30, 1920), 702A

Asahina, Y. and Asano, M.
Spilanthol
J. Pharm. Soc. Japan, through *J. Soc. Chem. Ind.*, 39 (Oct. 15, 1920), 672A

Bachstez, M.
Evaluation of pepsin
Pharm. Zent., 61 (Aug. 26, 1920), 479

Bailly, O.
Action of methyl and ethyl sulphates on solutions of alkaline phosphates
J. pharm. chim., 22 (Oct. 1, 1920), 248

Bauer
Detecting oxalic, lactic and tartaric acids
Chem. Ztg., through *Drug. Circ.*, 64 (Nov. 1920), 420

Baughman, W. F., Brauns, D., and Jamieson, G. S.
Cantaloup seed oil
J. Am. Chem. Soc., 42 (Nov. 1920), 2398

Bennett, C. T. and Salamon, M. S.
Eucalyptol assay
Perf. Essent. Oil Rec., through *J. Soc. Chem. Ind.*, 39 (Oct. 30, 1920), 704A

Bennett, C. T.
Oil of Artemisia glutinosa
Perf. Essent. Oil Rec., through *J. Soc. Chem. Ind.*, 39 (Oct. 15, 1920), 674A

Bohny, P. and Fleissig, P.
Identity test for neosalvarsan
Schweiz. Apoth. Ztg., 58 (Oct. 14, 1920), 521

Borkorny, T.
Chemical nature of enzymes
Biochem. Zsch., through *J. Soc. Chem. Ind.*, 39 (Oct. 30, 1920), 700A

Bourquelot, E. and Bridel, M.
Saccharose as an inversion product of gentianose
J. pharm. chim., 22 (Oct. 1, 1920), 241

Bourquelot & Herissey
Glucosides yielding coumarin
L'Union pharm., through *Drug. Circ.*, 64 (Nov. 1920), 420

Cramer, W.
Two kinds of animal fat
Brit. J. Exp. Path., through *Pharm. J.*, 105 (Oct. 2, 1920), 323

Damas
Difficulties of assay of morphine in the presence of saccharose
L'Union pharm., through *Merck's Rept.*, 29 (Oct. 1920), 145

Darvas, F.
Oil of plum kernels as almond oil substitute
Schimmel's Rept., through *Pharm. Era*, 53 (Nov. 1920), 333

Defren, G.
Use of lactic acid in food
Chem. Age, through *Merck's Rept.*, 29 (Oct. 1920), 146

DeLauney, P.
Glucosides from two orchids
Compt. rend., through *J. Soc. Chem. Ind.*, 39 (Oct. 15, 1920), 672A

Dietze, F.
Ether tests of U. S. P. IX.
D.-A. Apoth. Ztg., 41 (Oct. 1920), 100

Dox, A. W. and Roark, G. W.
Utilization of alphamethyl glucoside by Aspergillis niger
J. Biol. Chem., through *J. pharm. chim.*, 22 (Sept. 16, 1920), 231

Doyen
Therapeutics of sodium nucleinate
Compt. rend., through *Pharm. J.*, 105 (Oct. 23, 1920), 379

Dubin & Lewi
Stable vitamine product
Am. J. Med. Sci., through *Am. J. Pharm.*, 92 (1920), 752

Fernandez, O. and Luengo, N.
Terpin assay
Anal. fis. quim., through *J. Soc. Chem. Ind.*, 39 (Oct. 30, 1920), 704A

Florentin, O. and Vanderberghe, H.
Assay of aromatic hydrocarbons in benzin
Bull. Soc. Chim., through *Schweiz. Apoth. Ztg.* 58 (Oct. 7, 1920), 509

Githens, T. S.
Activity of digitalis glucosides
J. Am. Pharm. Assoc., 9 (Nov. 1920), 1060

Grant, E. H.
Detection of camphor oil in oil of sassafras
J. Am. Pharm. Assoc., 9 (Nov. 1920), 1065

Grinker, J.
Luminal in epilepsy
J. Am. Med. Assoc., through *Pharm. J.*, 105 (Oct. 2, 1920), 323

Herzog, J.
Methyl red as indicator
Apoth. Ztg., through *Pharm. Ztg.*, 65 (Aug. 28, 1920), 647

Hubbard, R. S.
Acetone assays
J. Biol. Chem., through *J. Soc. Chem. Ind.*, 39 (Oct. 15, 1920), 674A

Jacobs, W. H. and Heidelberger, M.
Aminoazo dyes from certain cinchona alkaloids
J. Am. Chem. Soc., 42 (Nov. 1920), 2278

Judd, H. M.
Iodometric assay of sugars
Biochem. J., through *J. Soc. Chem. Ind.*, 39 (Oct. 15, 1920), 668A

Kerb, J.
Phosphoric acid derivative of starch
Biochem. Zsch., through *J. Soc. Chem. Ind.*, 39 (Oct. 30, 1920), 700A

La Forge, P. B.
The heptoses of glucose
J. Biol. Chem., through *J. pharm. chim.*, 22 (Oct. 1, 1920), 269

Levene, P. A.
Crystalline uridin-phosphoric acid
J. Biol. Chem., through *J. pharm. chim.*, 22 (Oct. 1, 1920), 271

Levene, P. A.
Hydrolysis of the nucleic acid of yeast
J. Biol. Chem., through *J. pharm. chim.*, 22 (Oct. 1, 1920), 271

McDonald and Dean,
Chaulmoogra esters in leprosy
Pub. Health Rept., through *Drug. Circ.*, 64 (1920), 426

Macht, D. I.
Benzyl benzoate as vasodilator
N. Y. Med. J., through *Merck's Rept.*, 29 (Oct. 1920), 150

Macht, D. I.
Benzyl benzoate in whooping cough
Lancet, through *Pharm. J.*, 105 (Oct. 2, 1920), 323

Martin, F.
Preparation of isoamyl alcohol
J. pharm. chim., 22 (Sept. 16, 1920), 220

Meurice, R.
Titration of thiocyanates with permanganate solution
Ann. chim. anal., through *J. Soc. Chem. Ind.*, 39 (Oct. 30, 1920), 687A

Moir, J.
A polychromatic indicator
J. S. Africa Assoc. Anal. Chem., through *J. Soc. Chem. Ind.*, 39 (Oct. 30, 1920), 706A

Nagayama, T.
Histamine from albumoses
J. Pharm. Exp. Ther., through *J. Soc. Chem. Ind.*, 39 (Oct. 15, 1920), 673A

Pavlovsky
Origin of pepsin
Sem. Medica, through *Am. J. Pharm.*, 92 (1920), 758

Peterson, W. H. and Fred, E. B.
Fermentation of fructose by lactobacillus
J. Biol. Chem., through *J. pharm. chim.*, 22 (Sept. 16, 1920), 231

Rakshit, J. N.
Porphyroxine
J. Chem. Soc., through *Merck's Rept.*, 29 (Oct. 1920), 150

Reasoner, M. A. and Nichols, H. J.
Arsphenamine in non-syphilitic diseases
J. Am. Med. Assoc., through *Pharm. J.*, 105 (Oct. 2, 1920), 323

Ries, J.
Sodium cacodylate in pulmonary diseases
Corr.-Bl. Schweiz. Aertze, through *Pharm. Zent.*, 61 (Sept. 9, 1920), 518

Rosenblum, E. I.
Determination of diastatic activity
J. Soc. Chem. Ind., 39 (Oct. 30, 1920), 311T

Rosenthaler, L.
Microchemical detection of oils and fats
Schweiz. Apoth. Ztg., 58 (Oct. 28, 1920), 545

Schaap, O. P. A. H.
Theobromine assay of diuretin
Pharm. Weekbl., 57 (Oct. 9, 1920), 1234

Schweizer, K.
Ferrous zymophosphate
Bull. assoc. chim. sucr., through *J. Soc. Chem. Ind.*, 39 (Oct. 15, 1920), 672A

Sherk, D. C. L.
Physical constants of pure heptane
J. Am. Pharm. Assoc., 9 (Nov. 1920), 1042

Tornai, J.
Resorcin in influenza
Berl. klin. Wschr., through *Pharm. Zent.*, 61 (Sept. 2, 1920), 503

Vollmann
Tetralin
Farben Ztg., through *Pharm. Zent.*, 61 (Sept. 9, 1920), 519

Volmar
Photochemical production of monochlormethyl sulphate
J. pharm. chim., 22 (Sept. 16, 1920), 254

Von Frisch, K.
Physiological significance of volatile oils
Schimmel's Rept., through *Pharm. Era*, 53 (Nov. 1920), 334

White, E. C.
Mercury derivatives of the phthaleins
J. Am. Chem. Soc., 42 (Nov. 1920), 2355

Wise, L. E.
Glucose from saw-dust
J. Am. Med. Assoc., 38 (Oct. 1920), 32

Wrede, F.
Assay of selenium in organic compounds
J. Soc. Chem. Ind., 39 (Oct. 30, 1920), 707A

Zuntz, N.
Keratin as hair grower
Dtsch. Med. Wschr., through *Pharm. J.*, 105 (Oct. 2, 1920), 323

CLINICAL AND DIAGNOSTIC METHODS.

Mayer, O.
Assay of acetone in urine
Z. physiol. Chem., through *Pharm. Weekbl.*, 57 (Oct. 16, 1920), 1276

Philibert, J.
Analysis of urea, ammonia and amino-acids in urine
J. pharm. chim., 22 (Oct. 1, 1920), 278

Weiss, M.
Detection of uric acid
Münch. Med. Wsch., through *Drug. Circ.*, 64 (Nov. 1920), 418

MISCELLANEOUS.

Haase, F. A.
The Oersted centennial
D.-A. Apoth. Ztg., 41 (Oct. 1920), 101

Parker, Thomas
Rat poisons
Am. J. Pharm., 92 (Oct. 1920), 741

Richaud, A.
Biologic assay processes
J. pharm. chim., 22 (Oct. 1, 1920), 257

COUNCIL BUSINESS

A. PH. A. COUNCIL LETTER NO. 7.

(Abstract.)

WASHINGTON, D. C., Nov. 18, 1920.

34. *Results of vote of the A. Ph. A. on the election of officers, etc.*—The following officers have been elected: *President,* Samuel L. Hilton, Washington, D. C.; *First Vice-President,* Chas. E. Caspari, St. Louis, Mo.; *Second Vice-President,* David F. Jones, Watertown, S. D.; *Third Vice-President,* Hugo H. Schaefer, New York City. *Members of the Council,* Henry M. Whelpley, St. Louis, Mo., George M. Beringer, Camden, N. J., John G. Godding, Boston, Mass.

Referendum ballot: The raising of dues to $7.50 per annum and continuing JOURNAL and Year Book was carried.

35. *Election of the Local Secretary (see Item 32)—Result of vote.*—Mr. Geo. W. McDuff, of New Orleans, has received a majority of affirmative votes for Local Secretary and is therefore duly elected to this office for the period 1920–1921.

36. *Election of active members—Result of vote.* Motion No. 33 (Applications Nos. 204 to 244, inclusive, for active membership) has received a majority of affirmative votes.

37. *Election of a Chairman of the Commercial Section of the A. Ph. A. due to the departure of Prof. C. O. Lee for China.*—Under date of October 30, 1920, Secretary Day writes from Chicago, as follows:

"Professor C. O. Lee, Chairman of the Commercial Section of the A. Ph. A., has resigned from the faculty of the Purdue University School of Pharmacy and has gone to China. I have not heard from him directly, but had word through Dean Jordan, of the Purdue School of Pharmacy. Dean Jordan calls attention to the fact that it will be impossible for Professor Lee to serve as Chairman of the Section and that Professor Lee has stated that he desires to be relieved from this duty.

"I have corresponded with Secretary Chas. W. Holzhauer, of the Commercial Section, and Mr. Holzhauer now informs me that after consultation with his associates, Mr. Adam Wirth, of New Orleans, is recommended to the Council for appointment as Chairman of the Section. Will you propose Mr. Wirth's name to the Council for election with this recommendation?"

In compliance with Prof. Day's request, your Secretary takes pleasure in nominating Mr. Adam Wirth, of New Orleans, for Chairman of the Commercial Section. If there are no objections raised, the nominations will be considered closed and you are requested to vote on the election of the Chairman at this time.

38. *Appropriation for the Drug Trade Board of Public Information.*—Under date of Nov. 13, 1920, Secretary Day writes from Chicago, as follows:

"At the fifth session of the Council, held in Washington, May 10 (see JOURNAL OF THE A. PH. A., June 1920, p. 645) on motion of R. P. Fischelis, seconded by F. E. Stewart, an appropriation of $150 was made for the work of the Drug Trade Board of Public Information for 1921. There had previously been made an appropriation of $50 for the same purpose (see JOURNAL OF THE A. PH. A., June 1920, page 634, motion No. 51).

"It was evidently the intention of the Council that this appropriation should cover the Association year from meeting to meeting, and it was an oversight to specify for *1921.* I move, therefore, a correction of the minutes to strike out the words '1921.' This leaves the appropriation in a position where it can be used without restriction. As a matter of fact, the Drug Trade Board of Public Information has already presented a bill for the annual contribution due from the American Pharmaceutical Association amounting to $200 and a voucher has already been drawn for that amount. I have consulted with Treasurer Whelpley and Chairman Koch of the Finance Committee. They both agree with me that the intention of the Council was as above stated.

"The motion is seconded by Treasurer H. M. Whelpley."

39. *Election of active members.*—You are requested to vote on the following applications for active membership:

No. 245, Louis Nathan Blaustein, 2300 W. Oxford St., Philadelphia, Pa., S. and S. member; No. 246, Clarence K. Wagner, 356 S. Third St., Lehighton, Pa., S. and S. member; No. 247, William August Wörner, 801 Canal St., New Orleans, La.; No. 248, Ira J. Smith, 187 Indiana Ave., Hammond, Ind., S. and S.

member; No. 249, Clarence Sather, 602 E. Market St., Iowa City, Iowa; No. 250, Frank Neal Britcher, 211 Locust St., Hanover, Pa., S. and S. member; No. 251, Harold Adam Shoemaker, University of Oklahoma, Norman, Okla., S. and S. member; No. 252, Vivian K. Commons, 2430 University Ave., New York, N. Y.; No. 253, John A. Dorjahn, 152 High St., Blue Island, Ill.; No. 254, Samuel Morris Kreisser, 65 Sagamore St., Lynn, Mass., S. and S. member; No. 255, Oswald Rudolph Carlander, 1029 East 68th St., Seattle, Wash., S. and S. member; No. 256, William J. Macsata, 115 W. 68th St., New York, N. Y.; No. 257, Jerry McQuade, 25 City Hall Place, New York, N. Y.; No. 258, Goldie Esther Snyder, 2905 Center Ave., Pittsburgh, Pa.; No. 259, Ralph Alfred Kuhn, Main Street, Irwin, Pa.; No. 260, Paul Hanson Ross, 231 Grove Ave., Ridgway, Pa.; No. 261, Robert Stephen O'Brien, 545 Wm. Penn Place, Pittsburgh, Pa.; No. 262, Mrs. Helen Edna Nied, 1229 Columbus Ave., Pittsburgh, Pa.; No. 263, Roscoe O. Raiter, Cloquet Ave., Cloquet, Minn.; No. 264, Rafael Rivera, P. O. Box No. 20, Caracas, Venezeula, S. A., S. and S. member; No. 265, George Thomas Overstreet, 811 S. Francis St., Terrell, Texas; No. 266, Arthur E. Anderson, 39 Myrtle St., Jamestown, N. Y., S. and S. member; No. 267, Nathan Tischelman, 1 Willett St., New York, N. Y.; No. 268, F. Arthur Patty, 334 East 54th St., Seattle, Wash., S. and S. member; No. 269, Charles Dunsmore Fox, 106 Kirk Ave., Roanoke, Va.

A. G. DuMez,
Secretary.

MORE TRUTH ABOUT SACCHARIN.*

"The proponents of the use of saccharin as a substitute of sugar have doubtless detected in a recent publication[1] an unusual opportunity to promote their efforts in the defense of the chemical. The assertion was there made that the ingestion of saccharin, as shown by animal experiments, produces a large increase in the content of catalase in the blood. Since the function of facilitating oxidations in the body has repeatedly been attributed by the same investigator to this enzyme, it is a ready inference that saccharin has a beneficial action on the body. This has been particularly emphasized for the diabetic. It has been pointed out repeatedly, however, that the alleged function of catalase in the body remains both improbable and unproved. Despite the enormous doses of saccharin used, Stehle[2] of the University of Pennsylvania was unable to duplicate the effects claimed; and now Becht[3] of the Northwestern University Medical School has likewise contributed the results of elaborate series of investigations which serve to remove the illusion about saccharin that may have crept abroad. Saccharin is neither a food nor a potent drug. Its usefulness in dietotherapy is limited to the function of taste; to increase its use aside from this restricted scope would be a misfortune as, indeed, it often is a fraud."

* "Editorial Comment," *Journal A. M. A.*

[1] W. E. Burge, *Science*, 47, 549, 1918.

[2] R. L. Stehle, "Some Data concerning the Alleged Relation of Catalase to Animal Oxidations," *J. Biol. Chem.*, 39, 403, 1919.

[3] F. C. Becht, "The Influence of Saccharin on the Catalases of the Blood," *J. Pharmacol. & Exper. Therap.*, 16, 155, 1920.

EDITORIAL NOTES

Editor: E. G. EBERLE, Bourse Building, Philadelphia, Pa.

Committee on Publication: A. G. DUMEZ, *Chairman;* J. H. BEAL, CHARLES H. LAWALL, CASWELL A. MAYO, H. B. MASON, and the Editor-in-Chief of the JOURNAL, General Secretary, Treasurer and Reporter on the Progress of Pharmacy, *ex-officio.*

Collaborators: C. HERBERT PACKARD, President, A. Ph. A.; WILBER J. TEETERS, President, A. C. P. F., H. C. CHRISTENSEN, Secretary, N. A. B. P., E. FULLERTON COOK, Chairman, U. S. P. Revision Committee; CHARLES H. LAWALL, Chairman, Council A. Ph. A. The Chairmen of the Sections A. Ph. A.: A. G. DUMEZ, IVOR GRIFFITH, EDWARD SPEASE, CHARLES O. LEE, CURT P. WIMMER and E. F. KELLY.

A NEW YEAR HOPE.

Pharmacy is developed by the purposes we form; the conceptions that we entertain relating to pharmacy; the hopes for it that we cherish. It grows through our visions in the things that we purpose for it. Let us have it grow in our hopes and for the benefit of mankind.

INCREASING CONSUMPTION OF CARBONATED BEVERAGES.

The interment of John Barleycorn and his various cousins in this country has brought about an increasing use of soda water, and it may be interesting to note that it is an American product made originally in 1807 by Townsend Speakman,* a druggist, who was purveyor of drugs for the American Army during the War of the Revolution. The firm faith of Dr. Physick, then an eminent Philadelphia physician, in the healthful properties of soda water and his strong recommendation for it, brought many to Speakman's store. The druggist found that the addition of fruit juices made it more palatable, which increased its popularity, until to-day it may be considered the National drink. After all, Dr. Physick and Speakman builded better than they imagined.—*Pharmacal Advance.*

THE PHYSIOLOGICALLY INACTIVE DRUGS.[1]

"One of the places in which laboratory authority has been invoked to condemn clinical observation is in the use of drugs which do not exhibit marked physiological or poisonous qualities when administered to the lower animals.

"The doctrine that toxicity is an index of medicinal value, or that a medicine is simply a poison in small doses, and, consequently, that an agent without poisonous quality must necessarily be devoid of medicinal activity, is a dogma the essence of which traces back to Basil Valentine, or beyond. It is one of the last remaining vestiges of the old devil doctrine of disease which implied the use of powerful antagonistic drugs for disease expulsion.

"It is true that many recognized medical agents are toxic in overdoses; but this no more warrants the deduction that all medicines must be toxic than the observation that some common foodstuffs contain poisonous constituents warrants the deduction that all foodstuffs must exhibit poisonous qualities.

"Those who insist upon this dogmatic tying together of toxicity and therapeutic efficiency must surely overlook the so-called vitamins, so clinically potent, yet seemingly inert when administered to the healthy normal test animal.

"They must likewise have overlooked the historic dispute regarding the activity of erythroxylon coca. Here the issue was squarely joined between the clinical observers on the one side and the laboratory biologists and physiologists on the other. The clinicians insisted that properly prepared preparations of coca were active under clinical conditions; the laboratory biologists and physiologists asserted the contrary. The biologists tried cocaine on frogs, mice and rabbits, and proved to their satisfaction that its effects were comparable to those of thein and theobromine. The physiologists, after elaborate precautions to procure pharmaceutically perfect preparations, followed by detailed experiments under

---

* Antecedent of the late Joseph P. Remington, on mother's side of the family.

[1] From an address by J. H. Beal before National Eclectic Medical Association.—Reprinted from *National Eclectic Medical Association Quarterly*, September 1919.

supervision of the most expert laboratory workers available, brought in a report showing that in heroic doses coca preparations were about as active as weak tea, and that the same reactions could be produced by equal doses of milk and water, or even of pure water, and categorically declaring that coca had "an action so slight as to preclude the idea of its having any value, either therapeutically or popular.

"The clinicians, of course, were duly abashed by this highly scientific condemnation of their observations, and even so astute an observer as Edwin R. Squibb, the leading pharmaceutical manufacturer of his day, deleted coca preparations from his list on the strength of this scientific pronouncement.

"We know now that clinical observation was correct, and that the laboratory experts were mistaken. If cocaine and coca preparations have declined in therapeutic favor, it is because of their pernicious activity, not because of their inertness."

NEW DRUG PLANTS FROM EAST AFRICA.

John Roscoe, lecturer to Cambridge University for the Board of Anthropological Studies, has returned from East Africa, where he had been on a mission since May of last year for the Royal Society. The expedition was financed by Sir Peter McKie. His collection includes fifty or so varieties of herbs, some of which seemed to effect miraculous cures; many native poisons, great cases full of fetiches, implements and instruments going back to 2000 B. C. He says he has material for five years' work at six hours a day. His herbs and poisons are being tested and analyzed by Edinburgh University and by Burroughs, Wellcome & Co. A dozen cases of ethnological specimens are going to the Pitt-Rivers Museum at Oxford.

PHARMACY NATIONALIZATION IN FINLAND.

A Bill has been placed before the Finnish Riksdag for the conversion of the pharmacies in Finland into State property. The circumstance is said to have produced great unrest among the chemists' assistants and pharmacists, who have agreed to leave the profession in the event of the Bill being passed into law, and transfer their services to drug stores and the chemical industry, as they consider that the idea of State pharmacies is impracticable.

DISCOVERY OF ANTI-TUBERCULOSIS VACCINE FOR CATTLE ANNOUNCED.

The press of November 12 carries the announcement by Dr. Calmette of the Pasteur Institute, that the discovery of anti-tuberculosis vaccine for cattle is complete. Further statements of the report follow:

"The experiment in the vaccination of man against tuberculosis can only be made under satisfactory conditions in places not infected—this means in a place on the earth where tuberculosis does not exist.

"Such an experiment must be conducted on an island off western Africa, where there is not an indigenous population and where we can keep the monkeys for a long time. The monkey's sensibility to tuberculosis is as marked as that of man.

"The Pasteur Institute hopes to interest both great capital and great scientists to complete this work for the good of humanity. Such a laboratory as we plan can also be used to experiment on typhus, smallpox, yellow fever and leprosy, inasmuch as it will be in Africa, where we can get proper animals. This, of course, is all in the future, but as for today we can say that the discovery of anti-tuberculosis vaccine for cattle—which means an enormous reduction in child mortality—is complete."

Provisions have been made for establishing the experiment stations in New Guinea.

NAVAL RESEARCH LABORATORY TO HAVE NEW BUILDINGS.

Contracts have been signed by Secretary of the Navy Daniels under which five large reinforced concrete structures will be built at the naval research laboratory reservation on the banks of the Potomac River just below Washington, at a cost of $652,711. Secretary Daniels says that the department's purpose is not to undertake at the new navy laboratory work that other government departments and laboratories are doing.

INSPECTOR, ANTINARCOTIC ACT.

AGENT, ANTINARCOTIC ACT.

The United States Civil Service Commission announces open competitive examinations for the positions listed above. Vacancies in the Internal Revenue Service of the Treasury Department, at the salaries indicated below, and in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from these examinations, unless it is

found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The entrance salaries for both inspectors and agents will range from $1,800 to $2,250 a year, with allowance for subsistence and actual necessary traveling expenses when away from post of duty on official business. Receipt of applications to close December 28, 1920.

NEW DRUG COMPANY CHARTERED IN MARYLAND.

A new coöperative drug concern has been chartered under the laws of Maryland with a capitalization of $2,000,000. The company will be known as the Pontiac Druggists, Inc., and the incorporators are R. E. Lee Williamson and E. F. Kelly, Baltimore; Paul Pearson, Washington; Edward M. Sterling, Newark, N. J.; Walter McMillan, New York, and John E. Kennedy, Baltimore. Mr. Williamson is president and general manager of the Calvert Drug Co., a coöperative concern. Mr. Pearson is president of the Washington Drug Co., while Mr. Kelly, who is dean of the Department of Pharmacy, University of Maryland, will act as scientific supervisor.

PERSONAL AND NEWS ITEMS.

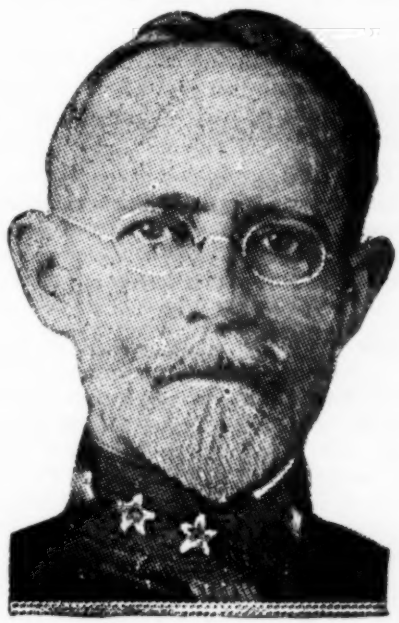
Dr. Charles Introit of Paris, France, gave his life as a sacrifice for science. He had undergone twenty-two operations as fingers and arms were successively removed to save him from the effects of burning with the X-rays. He had rejected the proposal to wear a thin casing of lead that would have protected him, because he could not use his limbs and body freely in his work. His researches were continued to the day of his death, that others might thereby be saved from the fate that had overtaken him.

Dr. William W. Coblentz, of the U. S. Bureau of Standards, has been awarded the Jannsen medal by the French Academy of Sciences. His work on the invisible rays of heat and his method by which he measures the heat of the stars played a practical part in the war, since he invented a mechanism whereby dark bodies such as ships, at night, could be detected by their heat emanations.

M. Charles Moureau, until recently professor at the Paris School of Pharmacy, has contributed a chapter on "Chemistry and Metallurgy" to the volume on "Chemistry and the War" of the French work in process of publication, "Lessons of the War."

Dr. F. Mollwo Perkin, D.Sc., the well-known chemist, has just received the honor of the Order of Commander of the British Empire. He is the son of Sir William Henry Perkin, the discoverer of aniline, who, in 1856, while conducting an experiment at his home for the production of quinine synthetically, discovered "aniline purple" or "mauve." This discovery led to the development of the industry for the production of colors from coal-tar products.

Rear-Admiral Edward Rhodes Stitt, head of the Navy Medical School, has been appointed Surgeon General of the U. S. Navy, to succeed Surgeon General W. C. Braisted. Rear-Admiral Stitt is a graduate in pharmacy as well as medicine, having graduated, in



REAR-ADMIRAL E. R. STITT.

1887, from the Philadelphia College of Pharmacy. His medical degree was earned in the Medical Department of the University of Pennsylvania. He is a member of the present U. S. P. Revision Committee.

During the war he served in the preparation of the medical officers entering the service, and in directing the laboratory of the naval service.

He was one of the Navy medical men called in consultation in President Wilson's recent illness.

Charles Edouard Guillaume Breteuil, head of the international bureau of weights and measures, received the Nobel prize for 1920 for physics.

Dr. Edgar Fahs Smith, ex-provost of the University of Pennsylvania, spoke in Philadelphia, November 21, on "Joseph Priestley in America." He told of Priestley's friendship with Washington, John Adams, Thomas Jefferson and other prominent Americans, after he was exiled from his English home. He paid a tribute to the tremendous impetus which Priestley gave to early chemical investigation in this country and concluded with an estimate of him as a man and scientist.

The ex-provost has accumulated probably the greatest collection of Priestleyana in this country, and exhibited many of the scientist's relics.

Dr. G. H. Meeker, member of the A. Ph. A., dean of the Graduate School of Medicine of the University of Pennsylvania, was guest of honor at a dinner given by the faculty, November 23.

Prof. Henry P. Hynson, Baltimore, has been honored with the presidency of the Eastern Shore Society, which consists of former residents and natives of that section of Maryland east of the Chesapeake Bay.

Dean Frederick Wulling has been quite active recently in the organization of the Minneapolis Division of the National Safety Council. Among his addresses in the interest of the work, he spoke to an audience of about 700 members of the Minneapolis Citizens' Auxiliary, to a group of traffic men on another occasion, and on other dates to various bodies interested in civic work.

J. T. Lloyd, son of John Uri Lloyd, recently delivered a lecture before the Cincinnati Section of the American Chemical Society, at the University of Cincinnati. The subject of his talk was "A Trip across the Colombian Andes."

F. E. Mortenson of the Dundee Pharmacy, Pueblo, Colorado, was elected state representative by a majority of over 2,000.

Dr. A. B. Stevens, formerly dean of the college of pharmacy, University of Michigan, spent about three weeks in Ann Arbor recently, visiting friends. He left November 4 for his home in Escondido, California.

Dr. H. Engelhardt, Baltimore, spoke before the German Apothecaries' Society in New York, at its last regular meeting, on the valuation of drugs by chemical and biological methods.

Jacob Rehfuss has sold his pharmacy at Sumner and Lexington Avenues, Brooklyn, to his two clerks, Louis and Edward Meister, who have been employed by him during the past three years. Mr. Rehfuss contemplates making his home in California.

W. G. Peckham, Second Vice-President and General Sales Director of the Norwich Pharmacal Company, was recently elected President of that corporation, filling the vacancy caused by the death of R. C. Stofer in September.

Frank L. McCartney, of the Monsanto Chemical Works, has been elected to fill the vacancy on the executive board of the American Drug Manufacturers' Association caused by the elevation of W. A. Sailer, of Sharp & Dohme, to the presidency; mention of the latter was made in the October number of JOURNAL A. PH. A.

Treasurer H. M. Whelpley has been entertaining original landlords of America. The Society of North American Indians met in St. Louis, November 15–19, on which occasion he delivered an address on "Original Landlords of America." Greetings were extended by Carl F. G. Meyer, also a member of the A. Ph. A. On November 19, a visit, under the direction of Dr. Whelpley, was made to the Cahokia Mounds of Illinois. On November 20, Mr. and Mrs. Whelpley entertained "originals" only; the evening was largely given to a powwow. The first evening of the convention was in conjunction with that of the Academy of Science, when the subject of his address was "Pre-Columbian Man in the Vicinity of St. Louis—The Preservation of His Vanished Records."

OBITUARY.

LYMAN TAYLOR DUNNING.

L. T. Dunning, member of the A. Ph. A., Sioux Falls, South Dakota, died of pneumonia, November 6.

Mr. Dunning was born July 26, 1847, was reared on a farm and received his early education in the public schools in Wisconsin. In 1873, he moved to Sioux Falls, and entered the employ of Dr. David Henry, and two years later he purchased his employer's business, which he maintained in the same location until the time of his death.

Mr. Dunning was a public-spirited citizen, was active in securing the building of railroads into the city and deeply interested in the development of the schools and other public institutions. In 1915, he was elected third vice-president of the N. A. R. D. He was unselfish, optimistic, conscientious and devoted much of his time to the public welfare and in an unostentatious way helped those less fortunate than himself. He was sincerely loved and respected by his fellow citizens. His wife died about three years ago. They had no children.

Mr. Dunning was affiliated with the Masonic bodies and a member of the Congregational Church.

G. HENRY SOHRBECK.

G. Henry Sohrbeck, of Moline, Ill., died November 2, at Lutheran hospital of his home city, aged 70 years. The deceased was born in Schleswig-Holstein and came to this country as a youth. He entered the employ of Richards Pharmacy as a boy and grew up in the business, becoming a partner and later sole proprietor. In 1914, the business was incorporated and he became president; Henry G. Carlson, vice-president, and L. R. Blackman, secretary and treasurer.

For a number of years Mr. Sohrbeck was a member and vice-president of the state board of pharmacy, resigning in 1903 after appointment by Governor Yates. He was a member of the Veteran Druggists' Association of Chicago and an ex-president of the Illinois Pharmaceutical Association. For years he sat on the directorates of the People's Bank & Trust Co. and the State Savings Bank & Trust Co., positions he held at the time of his passing. A vacancy is created in the board of school trustees of the Moline district by his death, his services as a trustee having extended also over a period of many years.

Mrs. Sohrbeck preceded him in death a year ago last spring. One daughter passed on in April of this year. Surviving him are one daughter, Mrs. L. R. Blackman of Moline, two granddaughters, Barbara and Marian Blackman, one brother, George W. Sohrbeck, of Moline, and one sister, Mrs. Matilda Besselin, of Rock Island.

Mr. Sohrbeck joined the American Pharmaceutical Association in 1888.

CHARLES ALBERT TATUM.

Charles Albert Tatum, president of the Whitall Tatum Co., Philadelphia and New York, died after a brief illness on Saturday, November 18, at his late residence, Middletown, N. J.

He was born in Philadelphia, Pa., January 17, 1849, son of Edward and Anna Smith Tatum. Entered firm of Whitall Tatum & Co. July 1, 1875, and was elected president of Whitall Tatum Co. when the firm was incorporated in 1901.

SOCIETIES AND COLLEGES.

THE NEW ORLEANS MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Secretary Geo. W. McDuff, of the Louisiana Pharmaceutical Association, has been elected Secretary for the Sixty-ninth Convention of the American Pharmaceutical Association. Wm. August Worner is chairman of the Local Arrangement Committee. Other members are: Robert F. Grace, chairman of the Louisiana A. Ph. A. Membership Committee; Adam Wirth, elected to succeed Charles O. Lee as chairman of the A. Ph. A. Section on Commercial Interests; Edward H. Walsdorf, C. Schertz, F. C. Godbold, Geo. W. McDuff, all of New Orleans; W. F. Peyton, Shreveport; J. W. Collins, Monroe; J. S. Seguera, Alexandria; L. Baudin, Baton Rouge; John R. Taylor, New Iberia; Harry P. Bourgeois, Morgan City; E. B. Holbrook, Donaldsonville; Frank E. Irvine, De Ridder; W. N. Wilson, president of Louisiana Pharmaceutical Association, Inde-

pendence; F. G. Rieger, Opelousas, and Harry Cohen, of Slidell. The Louisiana members of the American Pharmaceutical Association will have a banquet on January 27; at this time the coming convention will be discussed and further arrangements made.

NATIONAL DRUG TRADE CONFERENCE MEETING.

A regular meeting of the National Drug Trade Conference convened in Washington during the week of December 6, on which day a meeting of its executive committee was held. The sessions of the Conference were opened on the 7th, in Willard Hotel, by President Samuel C. Henry.

THE OFFICERS OF THE AMERICAN DRUG MANUFACTURERS' ASSOCIATION TO BE LOCATED IN WASHINGTON.

The American Drug Manufacturers' Association will move its office from Detroit to Washington during Christmas week and the Secretary expects to be located in the new office in the Albee Building, at the corner of 15th and G Streets, by January 3rd.

Mail sent to the A. D. M. A. on or after December 27th should be addressed to the American Drug Manufacturers' Association, Albee Building, Washington, D. C.

CONFERENCES ON ANTI-NARCOTIC AND PROHIBITION LAWS IN WASHINGTON.

The International Reform Bureau held a meeting in Washington, December 8–10. The announcement, prior to the meeting, provided for a discussion of the following questions:

"Does the test of enforcement show that we need additional legislation to reënforce the Volstead prohibition enforcement act?"

"What amendments are needed to the Harrison drug act to prevent the shipment of morphia from and through the United States to China?"

A hearing on the amendments suggested to the Harrison act was announced, at which Dr. Paul S. Reinsch, ex-minister to China, and Dr. Harvey W. Wiley, former chief of the Chemistry Bureau, Agricultural Department, were named as speakers, and also the following: Dr. Robert Watson, of New York, Canon W. S. Chase, of Brooklyn, and Dr. Wilbur F. Crafts, of Washington, respectively, president, chairman and superintendent of the International Reform Bureau; Senator Sterling, of South Dakota; Representative Upshaw, of Georgia; former Gov. Joseph W. Folk, of Missouri; Wayne B. Wheeler, counsel for the American Anti-Saloon League; and others in addition to those mentioned.

MEETING OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS.

The thirty-seventh annual meeting of the above-named association met at the Willard Hotel, in Washington, during the week of November 15. G. W. Hoover, of the Chicago Branch of the United States Bureau of Chemistry, presented abstracts of methods that have appeared in articles published, for the examination of acetylsalicylic acid, phenolphthalein, camphor preparations, mercurous chloride, mercuric chloride, mercuric iodide, papain, and turpentine. It was recommended that referees be appointed for the study of the methods of analysis of each of these drugs.

C. K. Glycart, of Chicago, read a paper outlining methods for the examination of morphine, codeine and heroine.

Dr. A. Viehoever, of Washington, D. C., presented methods for the detection of molds in drugs, foods and spices by means of the Chitin test; also for the identification and differentiation of plants and plant products by means of pollen grains; also as to the value of weights of unit volumes or the specific weight of crude drugs and spices; also as to important adulterants and substitutes for crude drugs and spices.

Dr. W. O. Emery presented a report upon the methods of analysis of arsenicals. A report upon the examination of procaine was presented by A. W. Hanson. C. D. Wright reported on the methods for estimation of monobromated camphor, phenolphthalein and hexamethylenetetramine. Prof. A. R. Bliss, of Atlanta, submitted a report on a method for the separation of quinine and strychnine, and also presented a method for the assay of physostigma and its preparations.

Recommendations for the further study of these subjects were approved by the Drug Section and submitted to the main convention.

A motion was adopted by the Drug Section providing that a representative should be appointed to coöperate with the revision committee of the United States Pharmacopoeia,

and to report progress at the next annual meeting of the Agricultural Chemists' Association.

The following officers were elected: *Honorary President*, H. W. Wiley, Woodward Building, Washington, D. C.; *President*, W. F. Hand, Agricultural College, Agricultural College, Miss.; *Vice-President*, F. P. Veitch, Bureau of Chemistry, Washington, D. C.; *Secretary-Treasurer*, C. L. Alsberg, Box 744, Eleventh Street Station, Washington, D. C.

PROHIBITION COMMISSIONER JOHN F. KRAMER GUEST OF PERFUMERS IN NEW YORK CITY, NOVEMBER 17.

Prohibition Commissioner John F. Kramer spoke to members of the perfumery trade at Hotel McAlpin, November 17. In his address, he stated that he would let a reputable manufacturer have all the alcohol needed, under the assurance that the alcohol would be used in accordance with the law.

His has been a liberal education in the legitimate uses of alcohol, stated the Commissioner. Since entering on his duties he has learned of the multitude of industries having a legitimate need for alcohol and it is his intention to see that such legitimate consumers receive adequate supplies without eternal trouble and suspicion being their lot simply because they use alcohol. He asserted that order was being brought out of chaos and that another year will see conditions vastly improved, while within three years legitimate users of alcohol will not even realize that there is a prohibition law.

He suggested that the club prepare a list of reputable perfumery manufacturers, supplementing this with another naming doubtful concerns.

EXECUTIVE COMMITTEE MEETING OF THE PROPRIETARY ASSOCIATION OF AMERICA.

An executive committee meeting of the Proprietary Association of America was held in New York City, November 23. The members are determined to do everything in their power to stamp out liquor traffic carried on under the guise of medicine business. There is unmistakable evidence that the members are jealous of their reputation and have spoken in no uncertain terms by the unanimous adoption of the following resolutions, carrying also instructions to their Legislative Committee:

Be it Resolved, by the Proprietary Association of America, in special meeting assembled, that the president of this association and the chairman of the Legislative Committee thereof be, and they are hereby instructed:

First. That they shall collect at whatever expense they may see fit to incur in so doing, and present to the officials of the Prohibition Division evidence of specific instances of the violation of the prohibition law in the manufacture and sale of so-called medicinal preparations, and shall urge upon said officials and assist them as far as possible in the prompt and speedy prosecution of all such violators of the prohibition law.

Second. That they respectfully tender to said officials of the Prohibition Division the services of the general counsel of the association in any cases in which such officials may think he may be of assistance in the prosecution of such violators of the law.

Third. That said officers of the association be and they are hereby further instructed to take such further steps as they may deem proper for rendering such practical assistance to the prohibition officials as may be possible for the securing of the enforcement of the prohibition law.

Fourth. *And be it further Resolved*, that the officers of the association be instructed to present at the earliest practical moment to the Commissioner of Prohibition a copy of these resolutions.

THE FAIRCHILD SCHOLARSHIP.

Unfortunately an error was overlooked in the announcement of the Department of Pharmacy, University of Minnesota (see first two words in third line of second paragraph, p. 1124, November issue, JOURNAL A. PH. A.). The award is *not* to be made to a "graduate student," but to a high school graduate, who has successfully finished his (or her) *first year's work* in a school or college of pharmacy, or Department of Pharmacy of a University, member of the American Conference of Pharmaceutical Faculties, and that each School, College or Department of Pharmacy be allowed and limited to two candidates. The competitive examination is to be conducted as stated in the paragraph referred to.

MASSACHUSETTS COLLEGE OF PHARMACY ENTERTAINS.

The Board of Trustees of the Massachusetts College of Pharmacy extended invitations to an informal reception and inspection of the

new building of the college for Wednesday evening, December 1, 1920. The members are informed relative to the new building of the Massachusetts College of Pharmacy, of which the management and faculty are justly proud; it was completed and furnished during this year. It is hoped to have a report of the occasion in the next number of the JOURNAL.

UNIVERSITY ENDOWMENTS.

Yale University has received from an unnamed graduate a gift of $3,000,000 to the general endowment of the university, contingent upon additional gifts of $2,000,000 by next January, exclusive of those through the alumni university fund. The gift is made to meet increased faculty salaries.

Cornell University has received a gift of $500,000 from Mr. August Heckscher, of New York City, for the endowment of research. The income of the fund created by Mr. Heckscher's gift will be used to maintain research professorships and to provide facilities for scientific work.

BEQUESTS TO EDUCATION.

The bequest of $25,000 to the New York College of Pharmacy by the late Max J. Breitenbach, whose death occurred recently, emphasizes the fact that at least one graduate in pharmacy appreciated what a technical education did for him. As a practical expression of gratitude and indebtedness, the Breitenbach bequest stands among the few examples of gifts to colleges of pharmacy from graduates who reached financial successes primarily through the practice of pharmacy and its related business lines. As the world goes, in the struggle for success, many graduates in pharmacy seem to forget the part that college training played in their own progress, for educational attainments can never be adequately appraised by monetary standards. Yet the dissemination of pharmaceutical knowledge is essential if the profession is to make any general progress, and as a means to this end, the college of pharmacy stands pre-eminent. Every instrumentality of this kind deserves the support of all good pharmacists. The Breitenbach bequest is noteworthy as coming from a pharmacist who in life had the college needs at heart and provided a place for it in his benefactions.—Editorial, *Pharmaceutical Era*, November 1920.

EXECUTIVE COMMITTEE OF ILLINOIS PHARMACEUTICAL ASSOCIATION SELECTS CHICAGO FOR NEXT ANNUAL MEETING OF THE ASSOCIATION.

The Executive Committee of the Illinois Pharmaceutical Association selected Chicago as the next convention city, and the annual meeting is to be held June 21–23, 1921. The association numbers 1429 members; the proceedings of the last convention have been mailed out.

A RESEARCH INFORMATION BUREAU.

The National Research Council has established a Research Information Service as a general clearing-house and informational bureau for scientific and industrial research. This "Service" on request supplies information concerning research problems, progress, laboratories, equipment, methods, publications, personnel, funds, etc.

Ordinarily, inquiries are answered without charge. When this is impossible because of unusual difficulty in securing information, the inquirer is notified and supplied with an estimate of cost.

Much of the information assembled by this bureau is published promptly in the "Bulletin" or the "Reprint and Circular Series" of the National Research Council, but the purpose is to maintain complete up-to-date files in the general office of the Council.

Requests for information should be addressed, Research Information Service, National Research Council, 1701 Massachusetts Avenue, Washington, D. C.

THE PHARMACIST AND THE LAW.

COMPULSORY HEALTH INSURANCE OPPOSED BY PHILADELPHIA PHYSICIANS.

Opposition to compulsory health insurance legislation in Pennsylvania was expressed by physicians at a meeting with the health insurance commission of Pennsylvania at the Bellevue-Stratford during the first week of December.

The commission, created last year to make a report to the next Pennsylvania legislature and possibly draw up a bill on health insurance, has been sitting throughout the State to obtain the views of employers, labor organizations and other interested parties.

Senator William T. Ramsey, chairman of the commission, presided at the meetings referred to, which drew representatives of various medical societies and was devoted to "medical aspects of health insurance."

The chief reasons advanced by the doctors against any proposed health insurance plan were that it would lower the ethical standards of the profession; would make for "quantity" instead of "quality" treatment and eliminate the "human factor" in medical treatment.

BASIS OF INVENTORY.

The Bureau of Internal Revenue has issued a ruling permitting market value to govern in inventories, with provisions. Until the end of 1917, when a special ruling was made on the point by the bureau, it was necessary for all concerns to figure their inventories on the basis of costs. Regulations based on the revenue law of 1918, however, specifically allowed them to be taken on the basis of cost or market, whichever was lower. Because cost was generally lower than market at the close of 1918 and 1919 inventories were figured on that basis. Having once established that method of computation, it was found necessary to obtain permission from the Internal Revenue Bureau to allow a change to a market basis. The amendment referred to grants permission to change, provided the market basis is consistently adhered to in the future. However, in instances where the market basis has been used in the recent past, because market was lower than cost, no change in the method of computation will be permitted.

SALE OF TINCTURE OF GINGER RESTRICTED.

Under a recent ruling (T. D. 3092) the sale of Tincture of Ginger, U. S. P., will be prohibited after February 15, 1921, except on permits to purchase, Form 1410, duly approved by local prohibition directors. The ruling reads:

"On and after ninety days from the date hereof, U. S. P. Tincture of Ginger, whether sold as Jamaica Ginger, Essence of Ginger, Extract of Ginger, or by whatever other name known, is hereby classed as a U. S. P. alcoholic preparation fit for use for beverage purposes, and may be manufactured, sold, transported and used only in the manner provided for other similarly classed official preparations listed in Section 60 (b) of Regulations No. 60 and Prohibition Mimeograph No. 87.

"Section 94 (a) of Article XVII of Regulations No. 60 is hereby revoked.

"An alcoholic extract or Tincture of Ginger made in accordance with the process described on Page 469, Ninth Revision of the U. S. P., will be classed as unfit for use for beverage purposes, provided the quantity of Ginger Root used is as follows:

Jamaica Ginger No. 30 Powder

400 grammes to make 1,000 millimeters."

This establishes a precedent; if the Revenue Department can destroy standards or fix them for medicines, other departments can do likewise. Pharmacists are desirous of making the prohibition law effective, but many believe there are other means of doing so; successive fines will not do it in every instance; this has been proven.

INDUSTRIAL ALCOHOL DIVISION CREATED.

The Division of Technology of the Prohibition Unit has been subdivided into two divisions, known as the Permit Division, and the Industrial Alcohol and Chemical Division.

The symbol for the Permit Division will be "Pro.-Permit." The work to be administered by this Division is as follows:

1. Examine and pass upon all applications for the manufacture of alcoholic products under Section 4, Title II (except denatured alcohol).
2. Determine all non-beverage uses of intoxicating liquor, and limitation of such uses.
3. Fix standards for articles manufactured under Section 4, Title II.
4. Investigate permit holders as to products manufactured; call for samples and other information.
5. Issue permits under Title II.
6. Examine and handle bonds under Title II.
7. Conduct trade investigations to determine whether products are bona fide and whether permitted articles are manufactured in accordance with approved formulae.
8. Maintain central file of permits and bonds under Title II.
9. The general administration of the features of Title II relating to permits and bonds.

The symbol of the Industrial Alcohol and Chemical Division will be "Pro.-I. A. & C." The work to be administered by this Division is as follows:

1. Supervise the construction and operation of industrial alcohol and denaturing plants, and control the work of the plant officers.

2. Develop uses of denatured alcohol by laboratory work and research.

3. Laboratory examination of samples submitted which are manufactured under Section 4, Title II, and report results to the Permit Division.

Examine alcoholic samples obtained in policing work, and report the results of analyses to field officers, Legal Division, and Permit Division.

Examine samples obtained under the Harrison Narcotic Act, and report results to field officers and Legal Division.

Examine samples of oleomargarine, butter, mixed flour, etc., and report facts to the Sales Tax Unit.

Examine denatured alcohol samples.

4. Administration of tax-free alcohol.

5. General administration of all the features embraced in Title III of the National Prohibition Act.

6. Assign storekeepers and st rekeeper-gaugers and handle the residue of old distillery work.

RENEWAL OF ALCOHOL PERMITS.

Important regulations amending Regulation 60 are set forth in T. D. 3096. Sections 9, 17 and 18 are amended and subdivision (c) of Section 20 has been repealed.

PURCHASE AND SALE OF MEDICATED ALCOHOL.

A letter from Prohibition Commissioner John F. Kramer is printed in *N. W. D. A. Bulletin No. 31*, November 23; it clears up some doubtful points relating to the purchase and sale of Medicated Alcohol. Part of the letter follows:

"You are advised that a wholesale druggist may sell alcohol medicated in accordance with any of the formulae set forth in Section 61, of Regulations 60, only to retail druggists or other persons holding permits to procure same, upon receipt of permits to purchase, Form 1410. No druggist, whether he sells in wholesale or retail quantities, may sell any quantity of medicated alcohol in excess of one pint to a person not a permit holder.

"Alcohol medicated by a wholesale or retail druggist or pharmacist in accordance with the formulae recited in said Section 61, may be sold in good faith for other than internal use, under the limitations prescribed by the Regulations without incurring liability to special tax as a liquor dealer.

"Properly medicated alcohol is regarded as unfit for beverage use, but in view of the fact that the medication is not of such a character as to completely denature the product, the restrictions set forth in the Regulations are deemed necessary to prevent its diversion to unlawful uses."

CONSUMERS OF SOFT DRINK PAY $51,000,000 IN TAXES.

Consumers of soft drinks have paid through the manufacturers of such libations during the last eleven months $51,000,000 to the revenue Department of the Government, according to a statement made November 12, before a closing session of the convention of the Association of Bottlers of Carbonated Beverages, in Cincinnati, by Dr. Carl L. Alsberg, chief chemist of the Department of Agriculture. These figures would indicate that the manufacturers of soft drinks do a business in excess of $500,000,000 a year.

FIRST MEDICAL BOOK OF IMPORTANCE WAS PUBLISHED IN UNITED STATES IN 1723.

Stan V. Henkels, collector of Philadelphia, is responsible for the statement that the first medical treatise in this country was printed in Philadelphia in 1723. The book is from the library of Dr. Jesse C. Green (dentist), who died a few months ago at his home in West Chester, Pa., aged 102 years. The book was first published in London and reprinted by Samuel Keimer, High Street, near the Market place, Philadelphia. Part of the title page reads: "Curiosities of Common Water Gather'd from the Writings of Several Eminent Physicians and also from more than Forty Years' Experience. By John Smith, C. M."

The extracts from the book, which follow, should convince every one that the drinking of nothing stronger than water, recently made mandatory by constitutional amendment, is for the health of our citizens.

"The first commendation of common water that I shall mention," writes the author, "is that which is written concerning it by Doctor Manwaring, in his methods and means of enjoying Health, wherein he saith that Water is a wholesome Drink, or rather the most wholesome. . . .being appointed for man in his best state, which doth strangely argue that Drink to be the most suitable for human nature. . .answering all the Intensions of common drinks, for it cools, moistens and quencheth Thirst, 'tis clear, thin and fit to convey the nourishment thro' the smallest Vessels of the Body. . .and is a Drink that is a Rule to itself and requires little Caution in the use of it, since none will be tempted to drink of it more than needs."

WHY THROUGH THE WHOLESALER!

Replying to an inquiry, the following are a few of the many reasons given by successful retail druggists for confining their purchases to the wholesaler:

—— *Because* ——

Price is as favorable to me as to my competitor.

Quality is guaranteed—the wholesaler gives good values.

Service is quicker than from any other source.

Credit is more easily obtained and maintained.

Turnover of stock is more frequent.

Stocks are fresher and better through frequent small purchases.

Losses due to excess stock are reduced.

Claims are more easily adjusted.

Accounting is simplified through concentration of purchases.

Discounts are easier to take since quick-turning stock provides cash.

Co-operation is offered by the wholesaler who knows local conditions, extends credit and gives timely advice.

Profits are better through increased sales on the same or less investment.

Do You Appreciate Your Wholesaler?

If, under normal conditions, buying through the wholesaler is so advantageous, how much more important is the retailer's welfare under the business stress of the present?

Cultivate This Buying Habit

Lilly Pharmaceuticals and Biologicals are stocked by all wholesalers. You can buy them in the easiest and most economical way. No other line is so accessible; nor can any other line be bought under a policy so perfectly adjusted to present market conditions. We said this in 1917; we repeat it with emphasis now.

Specify Lilly Pharmaceuticals and Biologicals Through Your Wholesaler

ELI LILLY & COMPANY

Indianapolis, U. S. A.

Mention the Journal of the A. Ph. A. when writing advertisers—It identifies you.

"We are advertised by our loving friends"

Recommend
Mellin's Food

to your baby food customers

Their satisfaction resulting from your recommendation will be to your advantage

N. Y. Q.
PRODUCTS

Acetanilide U. S. P.

Bismuth Subnitrate and other Bismuth Salts

Codeine and its Salts

Diacetyl-Morphine

Iodoform

Morphine and its Salts

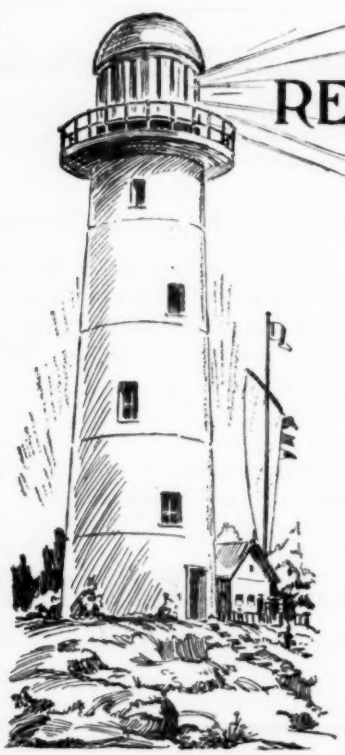
Potassium Iodide

Quinine and its Salts

Strychnine and its Salts

Thymol Iodide

No. 312



RELIABILITY

THERE is, perhaps, no sphere in all man's activity where *reliability* counts for so much as in the field in which drugs and chemicals are used.

When chemical products have earned, by the test of time, the reputation of being reliable, you have just cause to place confidence in them.

Correct results are assured by the use of our reliable products. Years of painstaking care and thoroughness stand back of their unquestioned purity and standard strength.

Throughout every process in the preparation of N. Y. Q. chemicals precision and precaution dominate. Reliability is the paramount issue. You can depend upon N. Y. Q. quality.

There can be no higher degree of Purity than that which is presented to you under the label of

NYQ

The New York Quinine and Chemical Works, Inc.
135 William Street, New York

Arsenic and Mercury are Indispensable in the Treatment of Syphilis. We recommend

SALVARSAN or NEOSALVARSAN

(Arsphenamine-Metz) (Neoarsphenamine-Metz)

powerful and easily administered spirochetecides, which are as efficacious as the imported products,

—AND—

BICHLORIDOL or SALICIDOL

(Mercury Bichloride) (Mercury Salicylate)

put up in COLLAPSULES (compressible ampules), which insure accuracy of dosage with a minimum of pain after intramuscular injection.

This combination of anti-luetics has no superior in the therapeutic field. Literature upon application to

H. A. METZ LABORATORIES, Inc., 122 Hudson Street, NEW YORK

From all over the world to you

The direct collection of our crude drugs and the purchase of all foreign drugs in large lots from first hands, the economical manufacture on a large scale, the elimination of expensive branch houses, and the distribution through the natural channels, that is, the Jobber, effect economies that enable us to supply the trade with pharmaceuticals of more than standard quality at our discount of 15% which equals 40% and 10% from standard lists.

We Keep up the Quality.....That's First
We Keep down the Price.....That's a close Second
We Save you 10 per cent.....That's Yours
If you buy Merrell's Pharmaceuticals.

SPECIFY MERRELL'S PHARMACEUTICALS—SAVE THAT 10 PER CENT

FOUNDED 1828

THE WM S. MERRELL COMPANY

CINCINNATI, U.S.A.

Insist upon having Gilpin, Langdon & Company's

PERFECT POWDERS FOR PERCOLATION

for use in your prescription work

GILPIN, LANGDON & COMPANY

Established 1845 Incorporated Baltimore, Md.

Purity-Quality Standard

ESSENTIAL OILS

Fritzsche Brothers, Inc.

New York

Two Good Leaders

Backed by National Advertising

Lysol Toilet Soap
Sample Free

Contains the necessary proportion of the antiseptic ingredients of Lysol Disinfectant to protect the health of the skin. It is also refreshingly soothing, healing, and helpful for improving the skin. Send for free sample.

Lysol Shaving Cream
(in Tubes)
Sample Free

Coatains the necessary proportion of the antiseptic ingredients of Lysol Disinfectant to render the razor blade, strop, cup, and shaving brush aseptically clean, guard the tiny cuts from infection, and give an antiseptic shave. Send for a free sample.

Lysol Shaving Cream and Lysol Toilet Soap are cashing in on the prestige and good-will created by Lysol Disinfectant.

Our national advertising links up these three members of the Lysol family by showing that Lysol Shaving Cream and Lysol Toilet Soap contain the right proportion of the antiseptic ingredients of Lysol Disinfectant.

Lysol

Reg. U. S. Pat. Off.

SHAVING CREAM

Smooth and Creamy, lathers freely, softens the beard readily. And Lysol Shaving Cream is antiseptic. These qualities combine to bring big repeat business.

Lysol Toilet Soap does all that a good soap should do and is also antiseptic—therefore healing and soothing. Brings a big volume of re-sales.

Feature Lysol Shaving Cream and Lysol Toilet Soap in conjunction with Lysol Disinfectant. Get the full benefit of our national advertising.

Stock up on the Lysol products at once.

LEHN & FINK, Inc.
635 Greenwich St., New York
Wholesale Druggists and Manufacturing Chemists
Makers of Pebeco Tooth Paste and Lysol Disinfectant

INTERESTING TO PHYSICIANS

You Will Advertise Your Business

By

Carrying Our Specialties In Stock As Follows:

		Dozen
Benzaldehyde and Benzyl Benzoate—Miscible, Solution	(2fl. oz. bottles)	$9.00
Benzyl Benzoate—Miscible, Solution	(2 fl. oz. bot.)	9.00
Bulgara Tablets	(50 in tube)	9.00
Enteric Glycotauro Tablets	(72 in tube)	9.00
Glycotauro, Cascara and Phenolphthalein Tablets	(50 in tube)	9.00
Lutein Tablets, 5 grs.	(50 in tube)	22.50
Lutein Tablets, 2 grs.	(100 in tube)	22.50
Mercurochrome—220 Soluble (Powder)	(10 gm. bot.)	16.20
Mercury Salicylate Ampules, 1, 1 1/2 or 2 grs. each	(12 in a box)	15.00
Ovarian Residue Tablets, 3 grs.	(50 in tube)	9.00
Ovary (Whole) Tablets	(50 in tube)	13.50
Phenolsulphonephthalein Ampules	(10 in a box)	15.00

A number of these are new, all are unusual. Our packages are easily converted into prescription form. Unsalable stock is returnable. Send for price list and catalog.

HYNSON, WESTCOTT & DUNNING
BALTIMORE

BENZYLETS

lower high blood pressure

by dilating the arteries.

In our long experience, nothing that we have ever made has been so quickly accepted by the medical profession or been so quickly and so generously stocked by our host of pharmaceutical friends.

We sincerely thank you for this highly esteemed co-operation.

In boxes of 24; most jobbers have them.

BENZYLETS **SHARP & DOHME**

Superfine
Impalpable
The Best—

McK & R Stearate of Zinc

We use only the finest white, triple pressed stearic acid and highest purity zinc salts in manufacturing. Therefore we have the finest, whitest and lighest product that can be bought.

Test it yourself and note its beautiful color, freedom from fatty odor and its velvety silkiness.

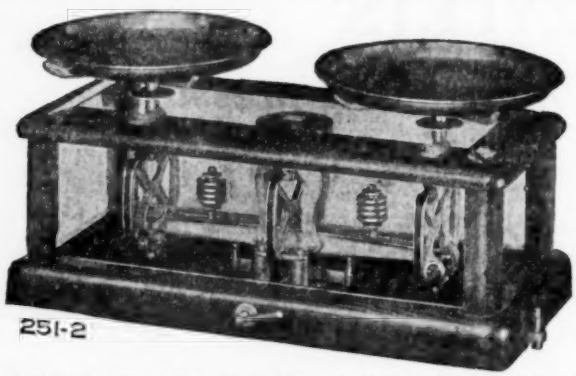
Bolted through the finest metal sieves (McK&R) **and packed in lined 50 pound barrels**

McKESSON & ROBBINS, Inc.

Manufacturing Chemists

Established 1833 **91 Fulton St., New York**

TORSION BALANCE



Style No. 251 (Oak) and Style No. 252 (Mahogany) with beveled plate glass. Working parts visible. Scale presents a very handsome appearance. Sensitive to 1/3 grains. May be loaded with 10 pounds without damage. Pans 9 inches in diameter. Arrest for quick weighing.

Write for Catalogue

THE TORSION BALANCE COMPANY

Office: 92 Reade Street New York
Factory: 147-153 Eighth St., Jersey City, N. J.

BRANCHES:

49 California St. San Francisco, Cal.

31 W. Lake St. Chicago, Ill.

The United States Navy

exercises great care in selecting books for its medical corps. It has adopted

Arny's Pharmacy

and has ordered it in large quantities. The reason for the adoption of Arny's "Pharmacy" is undoubtedly the unusually practical character of the book and its comprehensiveness in relatively small compass.

The first part deals with pharmaceutic processes, a striking feature being the clear discussion of the *arithmetic of pharmacy;* the second, with galenic preparations of the Pharmacopoeia and those unofficial preparations of proved value; the third, with the inorganic chemicals; the fourth discusses the organic chemicals; the fifth is devoted to chemical testing; the sixth discusses the prescription from the time it is written until it is dispensed; the seventh is devoted to laboratory work and exercises.

Octavo of 1056 pages, with 267 illustrations. By HENRY V. ARNY, PH.G., PH.D., Professor of Chemistry in the College of Pharmacy of Columbia University. Cloth, $8.00 net.

W. B. SAUNDERS CO. Philadelphia and London

TIN and FIBRE BOXES

American Can Company

New York

Palatable

Benzyl Benzoate—20%

AROMATIZED SUSPENSION

(Made from VAN DYK & CO. brand)

Antispasmodic in ASTHMA and DYSMENORRHEA

OUR SUSPENSION IS PREFERRED because it is:

NON-ALCOHOLIC
READILY MISCIBLE with WATER
RARELY REGURGITATES
PLEASANT to the EYE

Write for Clinical Data

United Synthetic Chemical Corporation
4 Platt Street New York, N. Y.

"I WILL

LOOK TO MY INSURANCE,"

meditates the careful druggist,

"I will have CAPITAL STOCK insurance; I will NOT be responsible in the other fellow's loss. I will seek service as well as protection. I will

INSURE

with the strongest STOCK COMPANY I can find which offers me the lowest rates consistent with the quality of insurance I require."

Then he insures

WITH

THE AMERICAN DRUGGISTS' FIRE INSURANCE COMPANY

1004-1005-1006 Mercantile Library Bldg.
CINCINNATI, OHIO

Thirty-Seven State Agencies

TEAR OFF HERE

The American Druggists' Fire Insurance Co.
CINCINNATI, OHIO

Gentlemen:—Send me your proposition on drug store fire insurance. My Board rate is.....

NAME.....

CITY OR TOWN.....

STATE.....

A. Ph. A.

THE CAPITAL STOCK FIRE INSURANCE CO. OF DRUGGISTS
ADFIC
CINCINNATI, O.

PREVENTING COMMON COLDS

THE usual number of "colds," catarrhs and other infections of the respiratory tract may surely be expected during the winter, even if there should be no serious recurrence of influenza.

The number of persons securing relief from these afflictions by preventive treatment is rapidly growing each year, and present indications point to an unusually heavy demand this season.

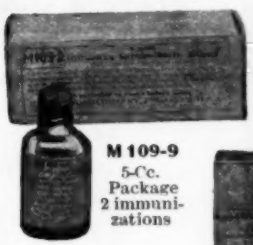
M 109-0—4-Syringe Package—1 immunization

Influenza Serobacterin Mixed

("Cold"—Catarrh Sensitized Bacterin)

THIS product undoubtedly enjoys the widest use of all anti-cold or anti-catarrhal vaccines. It has been on the market for a number of years. Over a million doses have been used and good results obtained. It is used for both preventive and curative treatment.

Send for Advertising Matter



M 109-9
5-Cc. Package
2 immunizations

Serobacterins

(Sensitized Bacterial Vaccines)

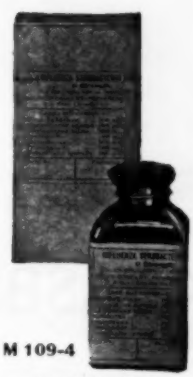
Produce immediate passive immunity, followed by a subsequent response in the form of a strong, active immunity.

Pneumo-Strep-Serum

(Antipneumococcic-Antistreptococcic Serum)

The latest development in Antipneumococcic Serums.

M 95-010—50-Cc. vial with Mulford Perfected Intravenous Apparatus.



M 109-4
20-Cc. Package
8 immunizations

MULFORD FOR THE CONSERVATION OF LIFE LABORATORIES
48179-D

H. K. MULFORD CO., Philadelphia, U. S. A.

Mulford

THE PIONEER BIOLOGICAL LABORATORIES

MATTISON'S MAGMA MAGNESIA

New Method Improved

Besides the economical method of preparing your own

MILK OF MAGNESIA

by simply using one ounce of Magma to a pint of water, is also suitable for use in making clear solution of Citrate U.S.P. and in any other place where a U.S.P. Magnesia Oxide is used.

1-lb. carton

Have you asked for your sample yet?

KEASBEY & MATTISON CO.

AMBLER, PENNA.

Makers of Magnesia Oxide and Carbonate in all forms, also Bromo-Caffeine, Alkalithia and other granular effervescent salts.

DRUG MILLING

The remedial value of a finished product often varies according to the skill exercised in milling the Crude Drug; exhaustion is always more rapid and complete when the milling has been skillfully done to a uniformity of size mesh.

A precise understanding of the physical character and remedial usefulness of Crude Drugs is essential in their proper milling.

The nature of a Crude Drug determines the kind of mill in which it should be comminuted; without complete equipment, proper Drug Milling is impossible.

"Hopkins Brand" Milled Crude Drugs do not clog in the percolator; hence they are evenly exposed to the action of the solvent. They yield finished products of uniform strength.

Crude Drugs

Milled to any Mesh Desired

J. L. Hopkins & Co., New York

Importers, Exporters, and Grinders of Standardized Crude Drugs

---

"CHIRIS"

ESSENTIAL OILS

of Standard Quality, insured by our own manufacture and distillation. Specify "CHIRIS" oils from your jobber.

Special Pharmaceutical Chemicals

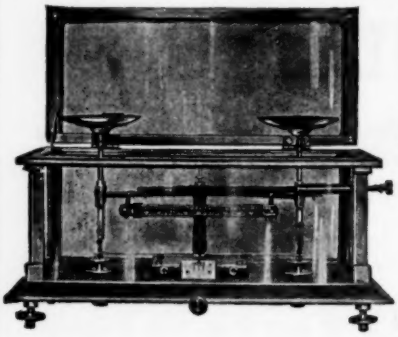
BARBITAL "CHIRIS" (Diethyl Barbituric Acid)
BARBITAL SODIUM "CHIRIS" (Soluble Sodium Salt)

ANTOINE CHIRIS COMPANY

Established in Grasse, France, 1768

18-20 Platt St. **NEW YORK**

American Works, Delawanna, N. J.



1840 STANDARD OF EXCELLENCE 1916

HENRY TROEMNER'S

BALANCES · SCALES · WEIGHTS

For All Pharmaceutical Purposes

Price List on Application

HENRY TROEMNER

911 Arch Street Philadelphia, Pa.

PRESCRIPTION CHEMICALS

The reputation of the Druggist—the satisfaction of the Physician—and the welfare of the Patient, require that chemicals used in dispensing should conform to the highest standards for purity. When ordering chemicals for the dispensing department

Specify "M. C. W."

MALLINCKRODT CHEMICAL WORKS

ST. LOUIS NEW YORK

POSITION WANTED

Young, well trained pharmacist, at present engaged in journalistic work, desires to make connections with a pharmaceutical publication or the publicity department of a pharmaceutical house. Metropolitan district of N. Y. preferred. Highest references—executive ability. Of Anglo-Saxon extraction. Address "Publicity" care this Journal.

SPECIAL ATTENTION If you want to sell your drug store—or buy one in any state—or want any kind of a position—or need any kind of an employee—or need a Doctor, Dentist, or Veterinarian—write

Guaranteed Service **F. V. KNIEST, R. P., Peters Trust Bldg., Omaha, Neb.** **Est. 1904**

Mention the Journal of the A. Ph. A. when writing advertisers—It identifies you.

Cold Weather Reminders

How is your stock of

AUBERGIER'S PASTILLES (Lactucarium), used extensively for coughs, hoarseness and all irritations of the throat?

BETUL-OL — sells rapidly in the Winter months. Constantly advertised. Don't wait until your supply gets too low. Order a supply today.

MORRHUOL-CREOSOTE (Chapoteaut) especially active at this time.

Order thru your jobber

E. FOUGERA & CO., Inc.

90-92 Beekman Street, New York City

ORIGINAL GENUINE EFCO E. FOUGERA & CO.

GRADUATE WORK IN PHARMACY

The demand for men and women specially trained along advanced pharmaceutical lines is large and is constantly growing.

THE MASSACHUSETTS COLLEGE OF PHARMACY **gives one year of graduate work, leading to the degree of Pharmaceutical Chemist (Ph.C.), and consisting of courses in analytical chemistry, including food and water analysis; bacteriology; microscopy; immunology and urine analysis. Graduates of other recognized colleges of pharmacy admitted.**

Unexcelled laboratories and equipment in the new building of the College. The environment, in Boston, is ideal for such advanced work, as many institutions of widely varying character are accessible and their facilities are available for outside study if desired.

Regular course of two years, leading to the degree of Graduate in Pharmacy (Ph.G.).

For catalogue and further information, address DEAN T. J. BRADLEY, Massachusetts College of Pharmacy, Boston, Mass.

College of Pharmacy
University of Notre Dame

Notre Dame, Indiana

Two Year Course, Degree Ph. G.
Three Year Course, Degree Ph. C.
Four Year Course, Degree B. S. Ph.

ST. LOUIS COLLEGE OF PHARMACY

This college gives thorough, graded courses of instruction for young men and women who desire to qualify themselves as pharmacists.

The fifty-sixth annual session opened October 4, 1920, and continues thirty-two weeks. Beginning with this session the completion of four years of high school work is required for admission of all students who intend to become candidates for a degree.

For further information write to the college, 2108-10 Locust St., St. Louis, Mo.

Department of Pharmacy, University of Maryland

(Maryland College of Pharmacy, 1841-1904)

LOMBARD AND GREENE STS., BALTIMORE, MD.

Graded course leading to Graduate in Pharmacy (Ph.G.) upon completion of two years' work, and Pharmaceutical Chemist (Ph.C.) upon completion of an additional year's work. Graduation from high school, or its equivalent, entrance requirement. For catalogue giving details apply to the Dean.

Pittsburgh College of Pharmacy
School of Pharmacy, University of Pittsburgh

¶ Offers a two years' course leading to the degree of Graduate in Pharmacy. Three years for the degree of Pharmaceutical Chemist.

For Catalogue address **DR. J. A. KOCH, Dean,** Pittsburgh, Pa.

Purdue University
School of Pharmacy

Lafayette, Indiana

Courses, Two year, degree Ph.G.
Four year, degree B.S. in Pharmacy

For catalogue, address
C. B. JORDON, Director

University of Illinois School of Pharmacy *CHICAGO COLLEGE OF PHARMACY*

Offers a two-year course for Graduate in Pharmacy and a three-year course for Pharmaceutical Chemist

School year begins October 1 and closes in June. Graduation from an accredited high school is the entrance requirement. The school occupies its own buildings, which have been newly equipped.

For bulletin, address W. B. Day, Dean, 701 So. Wood Street, Chicago.

Important New Texts and Editions

PHARMACY---*Caspari and Kelly*

New (6th) Edition

There has been a most thorough revision of this work, all parts being brought up-to-date, while new chapters on light and sterilization have been added in Part I.

Part I comprises **General Pharmacy,** which includes the study of weights and measures, specific gravity, the application and control of heat, mechanical subdivision of drugs, and methods of solution and separation, together with a classification and description of the various plant products and solvents used in pharmacy.

Part II treats of **Practical Pharmacy**. This involves a study of the official galenical preparations, incompatibility, together with the many operations of the dispensing counter. It has been the authors' aim to explain as clearly as possible the various processes and apparatus met with in this department, and to point out the difficulties likely to be encountered, as well as the remedies thereof.

Part III is devoted to **Pharmaceutical Chemistry,** the study of which is of paramount importance to every student of pharmacy. While the subject is a very comprehensive one, it has been confined, in this work, to such compounds as are either officially recognized in the United States Pharmacopoeia or are of special interest to pharmacists.

By CHARLES CASPARI, JR., late Professor of Pharmacy, University of Maryland. Revised by E. F. KELLY, Dean and Professor of Pharmacy, Department of Pharmacy, University of Maryland. Octavo, 954 pages, with 329 engravings. Cloth, $8.00 net.

NATIONAL STANDARD DISPENSATORY *Third Edition*

Every page bears evidence of careful and thorough revision. In addition at least 200 new articles have been introduced. The complete Pure Food and Drugs Act and Regulations and the Harrison Narcotic Act are appended, *together with the official decisions* necessary to their interpretation.

This single volume presents encyclopedic information concerning all substances used in pharmacy and medicine today. Full information is given regarding methods, apparatus, reagents and tests, biological assays, diagnostic reagents and clinical tests and physiological testing.

By HOBART AMORY HARE, B.Sc., M.D., Professor of Therapeutics and Materia Medica and Diagnosis, Jefferson Medical College; Physician to the Jefferson Medical College Hospital, Philadelphia. CHARLES CASPARI, JR., PH.G., PHAR.D., late Professor of Theoretical and Applied Pharmacy, University of Maryland; Member of the Committee of Revision of the United States Pharmacopoeia. HENRY H. RUSBY, M.D., Professor of Botany and Materia Medica, College of Pharmacy of City of New York; Pharmacognosist, United States Department of Agriculture, Member of Committee of Revision of United States Pharmacopoeia.

Magnificent Imperial Octavo, 2103 Pages, with 465 Illustrations. Cloth, $11.00; ¾ Leather, $13.00. Thumb Index, 75 cents extra.

New

QUALITATIVE CHEMICAL ANALYSIS--*Bradley*

Qualitative analysis is of use to the pharmacist in testing chemicals for identity and purity. The study of the subject is also of value because of the practical knowledge of chemicals and chemical processes acquired by the student, and because it gives training in careful observation and develops the reasoning powers as they are exercised in the interpretation of results.

This Laboratory Manual was prepared as a guide for the author's own classes, and the objects sought are to acquaint the student with the general methods of qualitative analysis and to prepare him to carry out such qualitative tests as the pharmacist may be called upon to make.

The course is arranged to include one hour of lecture, one hour of recitation and about three hours of laboratory work per week for one school year. Practice on the analysis of unknown solutions is provided for throughout the course. This is important, as it not only increases the interest of the student in the work but also develops his self-reliance by constantly putting him upon his own responsibility in doing his work and in interpreting his results. The introductory section on the theory of chemistry may be omitted if it is not necessary for the class to study or review this part of the subject. The Manual is in no sense a reference book, and in general only those things are included that are needed as a guide for the laboratory work.

By THEODORE J. BRADLEY, A.M., B.S., PH.G., Dean and Professor of Analytical and Organic Chemistry, Massachusetts College of Pharmacy. Octavo, 136 pages. Cloth, $2.50 net.

CLIP HERE

LEA & FEBIGER, 706-10 Sansom St., Philadelphia

Send me books checked (×) on terms checked (×).

☐ Remittance enclosed ☐ C. O. D. ☐ Charge my acct.

☐ Dispensatory..( ) ☐ Caspari.....($8.00) ☐ Bradley.....($2.50)

Name.....

Address.....

Mention the Journal of the A. Ph. A. when writing advertisers—It identifies you.

NEW PUBLICATIONS.

Textbook of Chemistry for Nurses and Students of Home Economics. Annie Louise Macleod. 180 pp. Illustrated. Price, $2.25. McGraw-Hill Book Co., Inc., New York.

Chemistry of Pulp and Paper Making. Edwin Sutermeister. 250 pp. $5^1/_2 \times 8^1/_2$. Illustrated. Price, $3.00. John Wiley & Sons, Inc., New York.

Analysis of Resins, Balsams and Gum-Resins. Karl Dietrich. Translated from the German. 2d English Ed., revised and enlarged. 432 pp. Price, 17s. 6d. net. Scott, Greenwood & Son, London.

Chemistry for Public Health Students. By E. Gabriel Jones, M.Sc., F.I.C., Lecturer in Public Health Chemistry in the University of Liverpool. Cloth. Price, 6 shillings. Pp. 244. London: Methuen & Co., 1920.

The Newer Methods of Blood and Urine Chemistry. By R. B. H. Gradwohl, M.D., Director of the Gradwohl Laboratories, Chicago and St. Louis, and A. J. Blaivas. Second edition. Cloth. Price, $5. Pp. 418, with 79 illustrations. St. Louis: C. V. Mosby Company, 1920.

A Practical Medical Dictionary, Words Used in Medicine, with Their Derivation and Pronunciation, Including Dental, Veterinary, Chemical, Botanical, Electrical, Life Insurance and Other Special Terms; Anatomical Tables of the Titles in General Use, and Those Sanctioned by the Basle Anatomical Convention; Pharmaceutical Preparations, Official in the U. S. and British Pharmacopoeias and Contained in the National Formulary; Chemical and Therapeutic Information as to Mineral Springs of America and Europe, and Comprehensive Lists of Synonyms. By Thomas Lathrop Stedman, A.M., M.D. Sixth edition. Cloth. Price, $6.50. Pp. 1144, with illustrations. New York: William Wood and Company, 1920.

Physiological Chemistry. A Text-Book and Manual for Students. By Albert P. Mathews, Ph.D., Professor of Biochemistry, The University of Cincinnati. Third edition. Cloth. Price, $6. Pp. 1154, with 109 illustrations. New York: William Wood and Company, 1920.

Chemical Reactions. Their theory and mechanism. By K. George Falk, Ph.D. Harriman Research Laboratory, The Roosevelt Hospital, New York. 12 mo, 211 pages, cloth. New York. D. Van Nostrand Company.

A Text-book of Materia Medica. An Account of the More Important Crude Drugs of Vegetable and Animal Origin. Designed for Students of Pharmacy and Medicine. By Henry G. Greenish, F.I.C., F.L.S., $9^3/_8 \times 16$ in. Pp. 568, with 250 illustrations. Third edition. 27s. net. London: J. & A. Churchill.

Making Advertisements and Making Them Pay. By Roy S. Durstine. New York: Charles Scribner's Sons. 1920 Pp. 264. $3.

Handbuch der Drogisten-Praxis. Ein Lehr-und Nachschlagebuch für Drogisten, Farbwarenhändler, usw. 13th Ed. G. A. Buchheister. Edited by Georg Otlersbach. Berlin: Julius Springer.

Trattato di farmacognosia ad uso degli Studenti di Farmacia e dei Farmacisti. Serafino Dezani. Torino: Unione Tipografico Editrice Torinese, Corso Raffaello 28. 800 pp. L. 44. For review see *Boll. chim. farm.*, 59, 309 (1920).

Warenlexicon für den Verkehr mit Drogen und Chenikalien mit Lateinischen, Deutschen, Englischen, Franzosischen, Hollandischen und Danischen Bezeichnungen. Joh. Karl König. 13th Ed., revised and enlarged by Paul Bohrisch, assisted by Hugo Mentzel. Braunschweig: Friedr. Vieweg & Sohn. 644 pp. M. 23, bound M. 34.

Pipefuls. By Christopher Morley. New York: Doubleday, Page & Co.

A year ago we were permitted to reproduce a poem "The Great Pharmacist," by this author. The pipefuls are short length essays from the author's newspaper columns and from periodicals to which they were first contributed.

PUBLICATIONS RECEIVED.

Effect of Deflation on Wholesale Drug Distribution Costs. By W. A. Hoover. While the material contained in the report has been prepared for wholesale druggists, it is of value to retailers.

Remarks by Lee M. Hutchins bearing on the increasing percentage costs of doing business during a period of shrinking volume due to falling prices, are included.

Technical Application of Hydrogen in Hydrogenation or Hardening of Oils. Principles involved in saturating unsaturated oils by hydrogenation. Commercial adaptability of the method to industrial and edible oils, technology of the process and a schematic outline of the apparatus used; reprinted from *Chemical & Metallurgical Engineering*, Vol. XXII, No. 16, April 21, 1920. By Harry L. Barnitz, Consulting Construction Engineer.

Causes of Skin Sores and Boils among Metal Workers. An investigation by the E. F.

"HORLICK'S"

The Original

**"business assurance"
carried by every druggist**

Order through
your Jobber

A. Ph. A. Membership Type Cuts
Price, 15 cents

MEMBER

The Journal of the American Pharmaceutical Association

211 Church Street, Easton, Pa. or 253 Bourse Building, Philadelphia, Pa.

PHYSIOLOGICAL ASSAYING
SOLICITED
W. A. PEARSON, Ph.C., M.D.
F. H. WIDMAN, M.D.
222 N. BROAD ST., PHILA., PA.

The A. Ph. A. Patrons of the Advertising Pages

THE JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION aims to give its advertisers full value; this is possible by the coöperation of the membership of the American Pharmaceutical Association—attention is therefore directed to the pages carrying the messages of the Advertising Patrons.

Directory of Advertisers

Books
Lea & Febiger xv
J. B. Lippincott Company ... —
W. B. Saunders Co. vii

Boxes, Tin
American Can Co. vii

Chemicals
The Calco Chemical Co. 2d cover
Mallinckrodt Chemical Works xii
Merck & Company ..... 2d cover
H. A. Metz Laboratories, Inc. . iii
Monsanto Chemical Works xx
New York Quinine and Chemical Works, Inc. ii
Powers-Weightman-Rosengarten Co. ..... —
E. R. Squibb & Sons .... 3d Cover
United Synthetic Chem. Corp'n. vii

Colleges and Schools of Pharmacy
Massachusetts xiv
Pittsburgh xiv
Purdue xiv
St. Louis xiv
University of Illinois xiv
University of Maryland xiv
University of Notre Dame ... xiv

Drugs
Gilpin, Langdon & Co. iii
J. L. Hopkins & Co. xi

Employment and Sales
F. V. Kniest xii
Want Ad xii

Fire Insurance
American Druggists' Fire Insurance Co. viii

Foods
Horlick's Malted Milk Co. xvii
Mellin's Food Company ii

Oils, Essential
Fritzsche Brothers, Inc. iii
Antoine Chiris Company xi

Perfumes
Frederick Stearns & Co. ..... —

Pharmaceuticals
Fairchild Bros. & Foster .. 2d cover
E. Fougera & Company, Inc. . xiii
Hynson, Westcott & Dunning .. v
Keasbey & Mattison Co. x
Lehn & Fink, Inc. iv
Eli Lilly & Co. i
Wm. S. Merrell Company iii
H. K. Mulford Company ix
Parke, Davis & Co. ... back cover
Sharp & Dohme v

Physiological Assaying
W. A. Pearson and F. H. Widman xvii

Scales and Balances
Henry Troemner xii
Torsion Balance Co. vi

U. S. Sales of Drugs and Chemicals ..... xviii–xix

Wholesale Druggists
McKesson & Robbins vi

Houghton & Company Research Staff. George Éwe is a contributor.

American-Made Synthetic Drugs—II. Examination of procaine (Novocain), barbital (Veronal), phenetidyl-acetphenetidin (Holocain), Cinchophen or Phenylcinchoninic Acid (Atophan), manufactured under Federal Trade Commission licenses. By Paul Nicholas Leech, Ph.D., William Rabak, Ph.G., Sc.B., and A. H. Clark, Ph.G., Sc.B. Chicago. Reprinted from *The Journal of the American Medical Association*, Sept. 6, 1919, Vol. 73, pp. 754–759.

IN THE STEPS

The Sales of Surplus Property conducted by the War Department offer such wonderful opportunities for economy in buying that discriminating manufacturers as well as consumers have bought and bought heavily.

Government specifications call for the highest quality in raw materials and finished products. The drugs and medicinal chemicals offered by the War Department in this sale conform to the highest standards of the War Department and are available at a time when manufacturers and consumers are demanding lower prices.

Send in your bids NOW. Bids may be submitted up to 10 A.M., Eastern Standard Time, January 3, 1921.

Acidum Boricum Tablets
Aether
Aethylis Chloridum
Agar-Agar
Aloe Pulvis
Aqua Ammonia
Argenti Nitras Crystals
Argenti Nitras Fusus
Bottles Argyrol
Bottles Argyrol or Equivalent (Vitargol)
Tubes Atropinae Sulphas
Bottles Balsam Peru
Bottles Barbital Tablets
Bottles Chloretone Tablets
Tins of Chloroform
Bottles Caffeina Citrata
Bottles Caffeina Nitrata
Camphor, Powdered
Bottles Capsicum
Bottles Chloralum Hydratum
Bottles Chrysarobinum
Bottles Collodium
Bottles Creosotum
Cupri Sulphas
Tubes Digitalinum
Tubes Digitalis
Bottles Emetine Hydrochloride
Bottles Emetine Hydrochloridum Tablets
Bottles Ferri Phosphas Solubis
Bottles Fluidextractum Colchici Seminis
Bottles Fluidextract Ergotae
Bottles Fluidextractum Ipecacuanhae
Bottles Hydrargyri Chloridum Corrosivum Tablets
Bottles Hydrargyri Iodidi Flavum
Bottles Hydrargyri Chloridum Mite
Bottles Hydrargyri Iodidum Rubrum
Bottles Hydrargyri Salicylas
Bottles Iodum
Boxes Iodine Swabs
Ipecacuanha Pulvis
Qts. Liquor Cresolis Compositum

The items offered are for sale by informal bid. Data as to quantity, how packed, location and conditions of sale may be had from the Depot Quartermaster nearest you whose address is given below.

Address all communications and bids to Depot Quartermasters at the addresses below:

New York
461 Eighth Ave.
New York City

Chicago
1819 W. 39th St.
Chicago, Ill.

Boston
Army Supply Base
Boston, Mass.

Atlanta
Transportation Bldg.
Atlanta, Ga.

San Francisco
Fort Mason
San Francisco, Cal.

San Antonio
San Antonio, Texas

OF BIG BUSINESS

Manufacturers, chemists and large institutions using medicinal drugs will find in this sale opportunities that do not exist in established markets. The War Department purposes transferring these items to American buyers at the lowest reasonable figure. Every bid will be given consideration. Interested purchasers are requested to study carefully a list of the items offered and are invited to inspect them at the Army Supply Bases nearest them. With a determination to sell these quantities, the Department, as explained above, will consider any proposal made, but will make awards and conclude negotiations with those persons making the most advantageous offer to the Government.

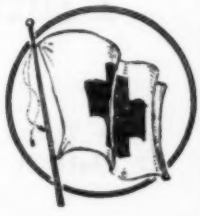
Bottles Liquor Hydrogeni Dioxide
Bottles Magnesii Carbonas Pulvis
Magnesii Sulphas
Methylis Salicylas
Bottles Oleum Aurantii Corticis
Bottles Oleum Caryophylli
Bottles Oleum Chenopodii Capsules
Oleum Gossypii Seminis
Bottles Oleum Menthae Piperata
Qts. Oleum Ricini (Castor Oil)
Bottles Oleum Tiglii
Bottles Phenol (Carbolic Acid)
Bottles Peptonizing Tablets
Bottles Pilulae Aloes Compositae Tablets
Bottles Pilulae Catharticae Compound
Bottles Plumbi Acetas
Tins Plumbi Acetas
Bottles Potassii Hydroxidum
Bottles Potassii Iodidum
Bottles Protargol or Equivalent
Tubes Quinine Hydrochlorosulphas
Tubes Quinine Dihydrochloridum
Tubes Quinine Hydrochlorosulphate
Bottles Sulphas Crystals, U. S. P.
Jars Sapo Mollis
Tubes Scopolamine Hydrobromidum
Bottles Strychninae Sulphas
Bottles Trochisci, Ammonii Chloridi
Bottles Quinine Sulphas Crystals
Lbs. Sodii Boras Pulvis
Bottles Sodii Carbonas Monohydratus
Tins Sodii Phosphas Exsiccatus Pulvis
Bottles Spiritus Ammonia Aromaticus
Lbs. Sulphur Lotum
Tubes Strychninae Sulphas Hypo Tablets
Tubes Sdroph Anthinum
Jars Unguentum Hydrargyri Chloridi Mitis
Tubes Unguentum Hydrargyri Oxide Flavi
Tins Unguentum Hydrargyri, 10% Mercury
Bottles Zinci Oxidum
Cartons Zinci Sulphas

When bidding, remember that buying groups may be formed to acquire such items that have a larger minimum selling unit than an individual purchaser would have use for.

SURPLUS PROPERTY BRANCH

OFFICE OF THE QUARTERMASTER GENERAL
WAR DEPARTMENT

MUNITIONS BLDG. WASHINGTON, D. C.



Mention the Journal of the A. Ph. A. when writing advertisers—It identifies you.

CHEMICALS
OF
QUALITY

ACETANILID
ASPIRIN
CAFFEINE (Pure Alkaloid)
CHLORAL HYDRATE
GLYCEROPHOSPHATES
(Sodium, Potassium, Calcium, etc.)
PHENACETIN U.S.P.
SACCHARIN
VANILLIN
COUMARIN
SALOL
SALICYLIC ACID U.S.P.
SODIUM SALICYLATE
PHENOL
PHENOLPHTHALEIN (Pure)

We have perfected the manufacture of Dakin's New Antiseptics.

We solicit your inquiries for

CHLORAMINE-T
DICHLORAMINE-T
CHLORCOSANE
HALAZONE

Monsanto Chemical Works
SAINT LOUIS, U.S.A.

New York
12 Platt St.

London, E. C.$_2$
62 London Wall

Liquid Petrolatum Squibb

Heavy (Californian)

The Squibb Seal

A Trustworthy Guaranty of Superior Quality and Service

The Quality Mineral Oil

Specially Refined for Internal Use. Excels as a Regulator of the bowels.

Pure, Palatable, Efficacious, Safe. A Perfect Mechanical Lubricant. Does Not Disturb Digestion if not taken within an hour before or after eating. Will not form a habit. When taken in proper dosage does not produce Leakage. Differs essentially from all other American oils and is superior to the Russian oils.

Is refined under the control of E. R. SQUIBB & SONS and exclusively for them by the *Standard Oil Company* of *California,* which has no connection with any other Standard Oil Company.

It must be remembered that Liquid Petrolatum Squibb does not stand in the same class with vegetable and animal oils. Unlike these, it is not assimilated by the system, and, consequently, does not increase the body heat, nor does it tend to produce adipose tissue in the body. Therefore it can be taken as freely in hot weather as in cold, and by all persons, young or old, including those who are stout or inclined to be stout.

More proof that Throat Discs sell

J. F. Wiesner, druggist in La Farge, Wisconsin, a town of 700, sold five seven-dozen packages of Medicated Throat Discs—thirty-five dozen—in four months.

Lynn Thompson, druggist in Scottsbluff, Nebraska, a town of 1746, says: "I have been in the retail drug business something like twenty years, and in all my experience I never handled a product that sold as Medicated Throat Discs do."

B. B. Hay, druggist in Ypsilanti, Michigan, a city of 6230, sold sixty-three dozen packages of Medicated Throat Discs last winter. They brought in $189 in cash.

A. H. Stacks, druggist in York, Pennsylvania, a city of 50,543, sold eighteen individual packages of Medicated Throat Discs in a single day. His total sales last winter amounted to thirty-six dozen.

Druggists everywhere—in large cities and in small towns—are selling Medicated Throat Discs: because they have merit; because they turn five- and ten-cent pieces into quarter dollars; because the buyer invariably comes back for another box.

Parke, Davis & Company
DETROIT

Special Offer

6 dozen, 1 dozen free.
1 gross, 2 dozen free.
5 gross, 1 gross free.
A window display and a quantity of counter folders included with each initial order when requested.